CommWorks
a 3Com company

CommWorks 5210 IP Telephony Manager

User Guide
Release 2.3
Part Number 10044879

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About This Guide

About This Guide contains an overview of the IP Telephony Manager User Guide, describes where to find specific information, lists conventions and related documentation, and explains how to contact CommWorks Corporation.

This guide describes how to install, configure, and operate IP Telephony Manager, as well as how to use it to troubleshoot and maintain components of the CommWorks IP Telephony Platform. Its primary audience is operations personnel.

CommWorks issues release notes with some products—visit our website at ***http://totalservice.commworks.com****. If the information in the release notes differs from the information in this guide, use the information in the release notes.*

Finding Information

The following table lists the location of specific information.

Table 1 Content Description

If you are looking for	Go to
System overview	Chapter 1
Hardware and software requirements	Chapter 1
Software installation procedures	Chapter 1
Configuration information using IP Telephony Manager	Chapter 2
Performance monitoring instructions	Chapter 2
Console window menu description	Chapter 3
Firmware upgrade procedures and general maintenance information	Chapter 4
Error messages	Appendix A
IP Telephony Manager commands from the UNIX command line	Appendix B
Glossary	Appendix C

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Conventions

The following tables list conventions in this guide.

Table 2 Notice Icon Description

Icon	Notice Type	Description
	Information Note	Information that contains important features or instructions.
	Caution	Information to alert you to potential damage to a program, system, or device.
	Warning	Information to alert you to potential personal injury or fatality. May also alert you to potential electrical hazard.
	ESD	Information to alert you to take proper grounding precautions before handling a product.

Table 3 Text Convention Descriptions

Convention	Description
Text represented as a `screen display`	`This typeface` represents displays that appear on your terminal screen, for example: `Netlogin:`
Text represented as **menu** or **sub-menu names**.	**This typeface** represents all menu and sub-menu names within procedures, for example: On the **File** menu, click **New**.
Text represented by <*filename*>	*This typeface* represents a variable. For example: <*filename*>.

Related Documentation

The following documents contain information about the components of the CommWorks IP Telephony Platform:

- CommWorks IP Telephony System Software Installation Guide
- CommWorks IP Telephony Overview Guide
- CommWorks IP Telephony Hardware Installation Guide
- Total Control 1000 Media Gateway Guide
- CommWorks 4200 Gatekeeper Guide
- CommWorks 4220 SIP Proxy Server Guide
- CommWorks 7220 Accounting Server Guide
- CommWorks 7230 Billing Support Server Guide
- CommWorks 7210 Directory Mapping Server and CommWorks 7240 Web Provisioning Server Guide

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- CommWorks IP Telephony Parameter (MIB) Reference Guide
- CommWorks IP Telephony Trap (Alarm) Reference Guide
- CommWorks 4007 SS7 Signaling Gateway Operation and Maintenance Guide

Contacting CommWorks

For information about Customer Service, including support, training, code releases and updates, contracts, and documentation, visit our website at http://totalservice.commworks.com.

Refer to the Documentation CD-ROM for information about product warranty.

Before contacting CommWorks Technical Support, have this information available:

- Contract number
- Problem description
  - Symptoms
  - Known causes
- CommWorks products
  - Software and hardware versions
  - Serial numbers
- Trouble clearing attempts

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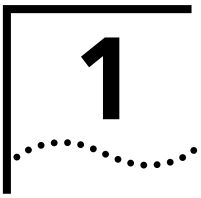

INSTALLATION

This chapter contains an overview of IP Telephony Manager and installation procedures for UNIX.

This chapter contains the following topics:

- Overview
- Management Workstation
- Prerequisites
- Before You Begin
- Removing Previous Versions
- Installing IP Telephony Manager
- Starting IP Telephony Manager
- Connecting to Entities
- Integrating with HP OpenView
- Linking CommWorks Objects

Overview

IP Telephony Manager, previously known as Total Control Manager is a software application that runs on a UNIX management station. This application remotely manages CommWorks Network Application Cards (NACs) and Network Interface Cards (NICs) through a Network Management Card (NMC) installed on the CommWorks 5210 IP Telephony Platform.

Two protocols govern these management functions: Simple Network Management Protocol (SNMP) between the NMC and the management station, and a proprietary CommWorks protocol between the NMC and the managed cards.

IP Telephony Manager communicates with the NMC through SNMP rules. Because the other NACs in the hub do not use SNMP agent software, the NMC acts as a proxy agent between these cards and the management station.

Standard SNMP traps can be enabled to send a trap message (or event notification) to one or more management stations. The management stations use these traps to create logs, trigger alarms, and initiate actions.

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The management station uses Management Information Bases (MIBs), defined for each card in the hub, to issue commands to the NMC. The NMC executes the commands and obtains the results using a proprietary CommWorks protocol. The NMC uses SNMP to send these results to the management station.

The NMC communicates with each installed card using a proprietary Management Bus Protocol (MBP). The NMC provides configuration management for each NAC in the hub and can set each parameter for a NAC to a specific value. The NMC also configures parameters to predetermined values when a NAC is installed in the hub. To help manage the configuration, the NMC can query the current value of parameters for each NAC and download software for upgrades.

Management Workstation

You can use HP OpenView or the CommWorks 5000 Network and Service Management System to monitor the status of all elements of the CommWorks platform and to act as an alarm server.

Use IP Telephony Manager to configure and monitor all the components of the CommWork's platform, such as configuring operational parameters, upgrading software, and backing up and restoring configurations.

Table 4 lists the additional management software for your workstation.

Table 4 Management Software

Software Package	Operating System	Function
Network management application, such as HP OpenView	HP-UX SUN Solaris	General network monitoring and alarm services
CommWorks 5000	SUN Solaris	Network monitoring and bulk operations

Prerequisites

Table 5 lists the hardware requirements needed to achieve the best performance from IP Telephony Manager.

Table 5 Hardware Prerequisites

Operating System	Hardware
SUN Platform	SPARC 20 Workstation, or more recent offering from SUN
	64 MB of RAM (minimum)
	1 GB Hard Disk Space (Space must be available on one partition. Swap space is recommended to be at or above 200 MB.)
	CD-ROM Drive
	Color Monitor
	Ethernet Interface

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Table 5 Hardware Prerequisites (continued)

Operating System	Hardware
HP Platform	HP 712/100 or higher Model 712 Workstation
	64 MB RAM (minimum)
	1 GB Hard Disk Space (Space must be available on one partition. Swap space is recommended to be at or above 200 MB.)
	CD-ROM Drive
	Color Monitor
	Ethernet Interface

Table 6 lists the software requirements needed to achieve the best performance from IP Telephony Manager.

Table 6 Software Prerequisites

Operating System	Software
SUN Platform	Solaris 2.6, or 2.7 with X11R6
	Java Runtime Environment by Sun (shipped with Solaris 7)
	Motif Runtime Kit (SUNWmfrun Package)
	HP OpenView Windows (OVW) Network Node Manager 6.1 (optional)
	HTML Browser (Netscape etc.)
HP Platform	HP-UX 10.20 or higher
	HP OpenView Windows Network Node Manager 6.1 (optional)
	HTML Browser (Netscape etc.)
	Java Runtime Environment by Sun

If you are installing HP OpenView for the first time, temporarily disable autodiscovery. Do not allow OpenView to discover the devices on your network automatically. This eases integration with IP Telephony Manager. You can enable autodiscovery after you install IP Telephony Manager.

Before You Begin

Before installing IP Telephony Manager on your system:

- Read the readme file (located at /cdrom/cdrom0/tcm/tcm_sol). It contains IP Telephony Manager installation notes.
- If you are integrating IP Telephony Manager with HP OpenView Network Node Manager, install and start HP OpenView.
- Remove any previous versions of IP Telephony Manager.

This chapter assumes you are running the Korn shell. For installation instructions for the C or Bourne shells, refer to the readme file.

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If you are using HP OpenView, you must install it before you install IP Telephony Manager. If not, HP OpenView does not integrate correctly. Make sure IP Telephony Manager and HP OpenView are installed on the same system. Remember to disable HP OpenView autodiscovery before you do a first time install/integration of IP Telephony Manager with HP OpenView.

Removing Previous Versions

When you remove IP Telephony Manager, you can either save your existing configuration, data, and log files (retaining chassis IP addresses and configuration information) or erase these files when you remove IP Telephony Manager.

CommWorks recommends that you save the existing configuration, data, and log files - (Option 1).

Option 1 To remove a previous version of IP Telephony Manager without erasing your existing IP Telephony Manager database files:

1. Type **cd $TCMHOME**.
2. Type **./Remove**.

Option 2 To completely remove a previous version of IP Telephony Manager, including all IP Telephony Manager database files:

1. Type **cd $TCMHOME**.
2. Type **./Remove -c**.

Installing IP Telephony Manager

To install IP Telephony Manager:

1. Move to the drive and directory that contains the installation files.
2. Create a directory for the software installation.
3. Set the TCMHOME variable to point to that directory.
4. Log in to the UNIX workstation as root.
5. Insert the CommWorks CD.
6. Mount the cdrom drive if necessary.
7. Type: **cd <***working directory***>** (for example, cd /cdrom/cdrom0/tcm/tcm_sol).

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8 From the command line prompt, type the following commands and press **Return** after each:

```
TCMHOME=<installation directory> (for example, /opt/tcm)

export TCMHOME

mkdir -p $TCMHOME

cd cdrom/cdrom0/tcm_sol (for HP, tcm_ux)

./install
```

A message appears:

```
The script will make adjustments, only as needed, to
system files in /etc/imit.d, the crontab, /etc/services,
and /usr/lib/x11.

If TCM is later removed, these adjustments will be
undone to restore the original state.

Do you wish to continue [y/n]
```

9 Type **y**, and then press **Return**.

The installation proceeds, listing files as they are installed. The following message appears to indicate the installation has completed successfully:

```
TCM installation is complete
```

You can now enable HP Overview autodiscovery on your system.

Setting PATH and LD_LIBRARY_PATH

Before you can start IP Telephony Manager, you must add $TCMHOME to the PATH statement and indicate the location of the IP Telephony Manager library files as follows:

From the command line prompt, type the following commands and press **Return** after each:

```
PATH=$PATH:$TCMHOME/bin

export PATH

LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$TCMHOME/lib

export LD_LIBRARY_PATH
```

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Starting IP Telephony Manager

After you complete the installation and modify the path statement, you can start IP Telephony Manager.

To start the IP Telephony Manager, from the command line prompt, type one of these commands:

```
# xtcmvfpd
```

or

```
# xtcmvfpd <target chassis IP address>
```

The first command causes a list of the chassis components to display. You can then select the component that you want to start. The second command specifies the IP address of the component that you want started.

The IP Telephony Manager graphical user interface (GUI) opens a virtual display of the target chassis. If the virtual display does not appear, set and export the paths according to the instructions in this chapter.

For a complete description of the menus on the GUI, refer to Chapter 3 Navigating and Using the System.

Connecting to Entities

CommWorks IP Telephony Manager lets you configure and monitor any CommWorks IP Telephony entity (for example the Media Gateway, Gatekeeper, Accounting Server, Billing Support Server.) on your system. To connect to the individual entities:

1. Start IP Telephony Manager.
2. Click **File**, and click **Open**, and then click **New** from the IP Telephony Manger Console window.
3. Enter the name and IP address of the entity.
4. Verify that the community strings are as follows:
   - Read-only is **public** (case sensitive)
   - Read/write is **private** (case sensitive)

To modify these default settings, refer to Chapter 4, topic: Changing the SNMP Community Strings.

5. Click **OK**.

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To view the entity after the it is connected using IP Telephony Manager:

1 Start IP Telephony Manager.

2 Click **File** and then click **Open** from the IP Telephony Manger Console window.

3 Select the entity from the list.

4 Click **OK**.

The entity appears in graphical form. When selected, the entity is blue; when deselected, the entity is black.

Determining Gatekeeper and Media Gateway Connectivity

To test Gatekeeper to Media Gateway connectivity, use the following procedure.

1 Using IP Telephony Manager Console window, select the edge server card.

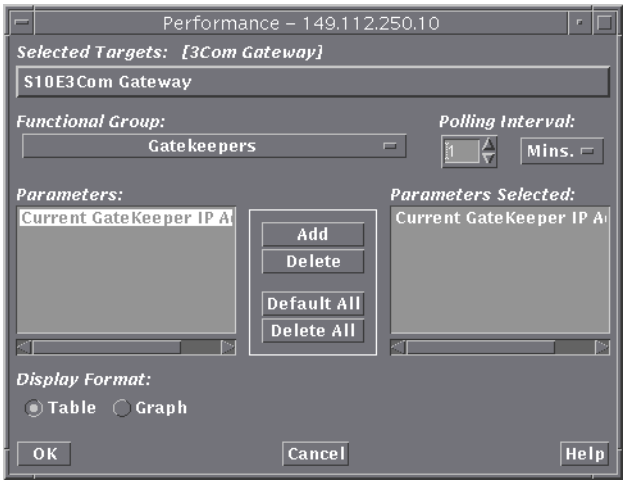
2 On the menu bar, select **Performance** and then **Performance Monitor.**

The Select Entity window appears.

3 Select the entity **3Com Gateway** and then click **OK**.

The Performance window appears.

Figure 1 Performance Window



4 Select **Gatekeepers** from the Functional Group.

5 Select **Current Gatekeeper IP address** and click **Add**. Click **OK**.

A real time table appears and displays the selected Gateway and the Gatekeeper to which it is registered. The IP address of the Gatekeeper to which it is registered also appears.

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Integrating with HP OpenView

The IP Telephony Manager installation script installs OpenView integration files to the appropriate OpenView Network Node Manager subdirectories.

OpenView integration occurs as part of the IP Telephony Manager installation, when the OpenView environmental variables are set beforehand. To integrate IP Telephony Manager with OpenView manually, follow the procedure below.

1 Set the OpenView environmental variables.

```
# cd /opt/OV/bin

# . ./ov.envvars.sh
```

2 Test the environmental variables.

```
# cd $OV_BIN

# pwd
```

Solaris responds as follows:

```
/opt/OV/bin
```

3 Change to the directory that contains the integration files.

```
# cd $TCMHOME/ovw
```

4 Install the integration files.

```
# ./Install
```

You can run the **$TCMHOME/ovw/Install** script at any time. You do not need to run $TCMHOME/ovw/Remove before running $TCMHOME/ovw/Install again.

HP OpenView integrates the IP Telephony Manager icons; this lets you access IP Telephony Manager from HP OpenView.

Fixing Incorrect Maps

If you populate CommWorks devices in OpenView before you installed IP Telephony Manager, IP Telephony Manager integration does not change the component type from a non-CommWorks type to a CommWorks chassis type. You cannot do this automatically in HP OpenView. For best results, delete and rediscover the CommWorks devices.

You can also use the OpenView **ovtopofix -r -o <***object id***>** command. CommWorks object IDs 1.3.6.1.4.1.429.2.1 through 1.3.6.1.4.1.429.2.9 must each be individually specified.

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If CommWorks devices were populated in OpenView before IP Telephony Manager was installed, the network map will not display the CommWorks bitmaps correctly after IP Telephony Manager integration. This occurs even if the CommWorks menu options are not enabled and the **isUSREntNetHub** capability is not set to **True**. For best results, delete and rediscover the CommWorks devices.

Removing HP OpenView Integration

To remove OpenView integration:

1. Login as root.
2. Type the following:

```
cd $TCMHOME/ovw

./Remove -r
```

While all CommWorks files are removed from HP OpenView, no changes are made to the runtime databases. One of the primary purposes of removal is to prepare for a new installation.

Erasing IP Telephony Manager

To erase IP Telephony Manager from HP OpenView, replace the current maps with new ones. You can also delete and rediscover all the CommWorks devices from each map.

Verifying the Installation

Start IP Telephony Manager with the following commands:

```
> TCMHOME=<installation directory>

> export TCMHOME

> PATH=$PATH:$TCMHOME/bin

> export PATH

> ./xtcmvfpd <TCH IP_Address/HostName>
```

IP Telephony Manager opens.

For a complete description of the menus on the GUI, refer to Chapter 3 Navigating and Using the System.

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Linking CommWorks Objects

If you choose to install HP OpenView, you must install it before IP Telephony Manager. This lets you start IP Telephony Manager directly from HP OpenView.

To link CommWorks objects in HP OpenView to IP Telephony Manager, use the following procedure.

1 Type:

```
#cd $OV_BIN

#./ovstart

#./ovw
```

2 Go to the chassis to be linked, and then click on it.

3 Right click and select **Symbol Properties** from the pop-up menu.

4 Under Behavior, click **Execute**.

5 Under Application Action, click **USRRobotics: USRVFPD**.

6 Click **Target Objects**, click **Add**, and then click **OK**.

7 Click **OK** on the window that appears.

8 Double-click the object with the chassis IP address.

The chassis graphical user interface appears.

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2 CONFIGURATION

This chapter describes how to configure CommWorks IP Telephony Manager.

This chapter contains the following topics:

- Management Station Configuration
- Component Configuration
- Synchronizing Network Time
- Auto Response
- Setting Authorized Stations
- Defining a Range of IP Addresses for Authorized Access
- Threshold Monitoring Configuration
- Saving and Restoring Configurations

Refer to Chapter 3 for a complete description of the IP Telephony Manager menus.

Unless otherwise specified, this document uses the generic term edge server to refer to either the edge server card or the EdgeServer Pro card.

Management Station Configuration

You should not need to configure your management station after installing IP Telephony Manager for UNIX. IP Telephony Manager adds the following files to locations as set up in **$OV_BIN/ov.envvars.sh**:

Table 7 Files added to HP OpenView Windows Directories

Category	File location
Field definitions	$OV_FIELDS/C/usr_fields
Application registration	$OV_REGISTRATION/C/USRobotics
CommWorks-specific symbols	$OV_SYMBOLS/C/Connector/USR* (various)
CommWorks icon bitmaps	$OV_BITMAPS/C/connector/usr.* (various)
CommWorks MIB	$OV_SNMP_MIBS/Vendor/USRobotics/usr-mib
OID-to-symbol mappings	appended to $OV_CONF/C/oid_to_sym

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Component Configuration

The IP Telephony Manager Console window is used to select target components whenever you are performing configuration, sending commands, or upgrading components through software download.

Launching the Configuration Tool

There are two ways to launch the Configuration Tool:

- From the IP Telephony Manager Console, select a target from the IP Telephony Manager Console window, and then from the **Configuration** menu, select **Programmed Settings**.
- From the UNIX command line, type **xtcmconf** followed by the IP address or hostname of the target device and the target slots and channels (refer to Appendix B Command Line Interface for more details).

Synchronizing Network Time

You must synchronize the system time of each component in the network accurate tracking of the IP telephony traffic. To achieve system synchronization, set each Gatekeeper, SIP Proxy Server, and Back-end Server to Greenwich Mean Time (GMT) and use the Network Time Protocol (NTP) on all system components.

Setting the Time Zone

For each Gatekeeper, SIP Proxy Server, and Back-end Server in the IP telephony network, set the time zone to GMT.

1. From the Windows desktop, click **Start**, then **Settings**, and then click **Control Panel**.
2. Double-click **Date/Time**.

   The Date/Time Properties window appears.
3. Click **Time Zone**.
4. From the drop-down list, select **[GMT] Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London**.
5. Click **OK**.

Recording the NTP IP Addresses

NTP uses a primary and a secondary NTP time server for system time. You can use the IP addresses of NTP time servers that are local to your network, or you can use public NTP time servers. The IP addresses of public NTP time servers are available on the internet. Use the following procedure to record a primary and secondary NTP time server address.

Selecting Local NTP Servers

If your local network includes local NTP time servers, record the IP address of the primary NTP time server and the secondary NTP time server.

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Selecting Public NTP Servers

1 From any computer with internet access, access the following website:

http://www.eecis.udel.edu/~mills/ntp/clock1.htm

2 From the website, record the IP addresses for two separate active servers. One is used as the primary NTP server, and the other is used as the secondary NTP server. We recommend choosing NTP server locations that are as close to the Media Gateway chassis as possible.

Setting the NTP Parameters

Use NTP to synchronize the time across the network. The NTP parameters must be set for the HiPer NMC card in each Media Gateway chassis, the Gatekeepers, SIP Proxy Servers, and the Back-end Servers.

All Media Gateway chassis components are automatically synchronized through the controlling HiPer NMC after it is configured for NTP.

Setting the NTP Parameters for the HiPer NMC

For the HiPer NMC card in each Media Gateway chassis, do the following:

1 Using IP Telephony Manager, open the Media Gateway chassis.

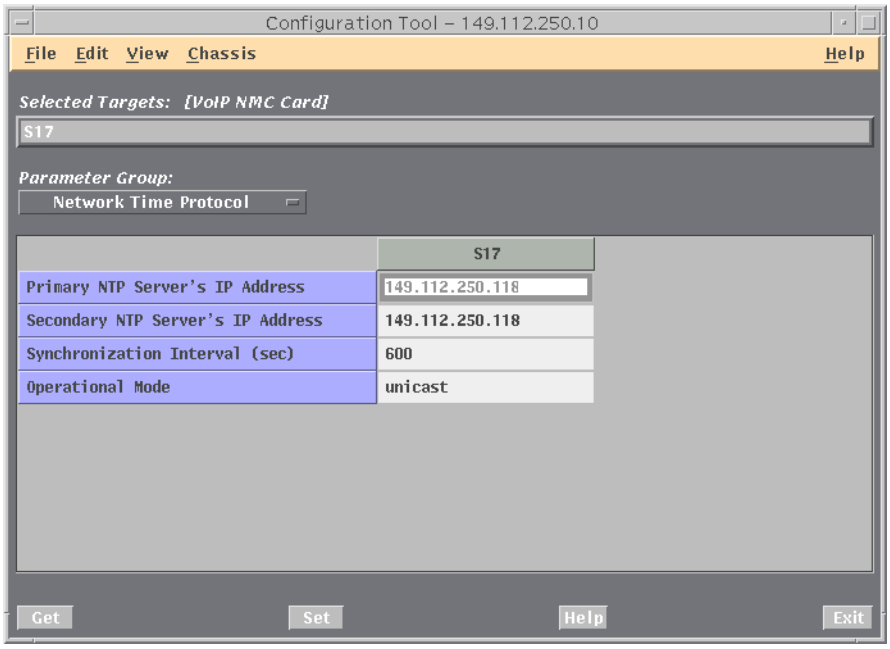
2 Select the HiPer NMC card.

3 Click **Configuration,** then **Programmed Settings** from the IP Telephony Manager Console window.

4 Select **Network Time Protocol** from the Parameter Group drop-down list.

The Network Time Protocol windows appears.

Figure 2 Media Gateway Network Time Protocol Window



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5 Enter the Primary and Secondary NTP IP Addresses (refer to Recording the NTP IP Addresses).

6 Set the Operational Mode to **Unicast**.

7 Click **Set**.

Setting the NTP Parameters for the Other Entities

For each Gatekeeper, SIP Proxy Server, and Back-end Server:

1 Using IP Telephony Manager, open the targeted server.

2 Select the server icon.

3 Select **Configuration**, then **Programmed Settings** from the IP Telephony Manager Console window.

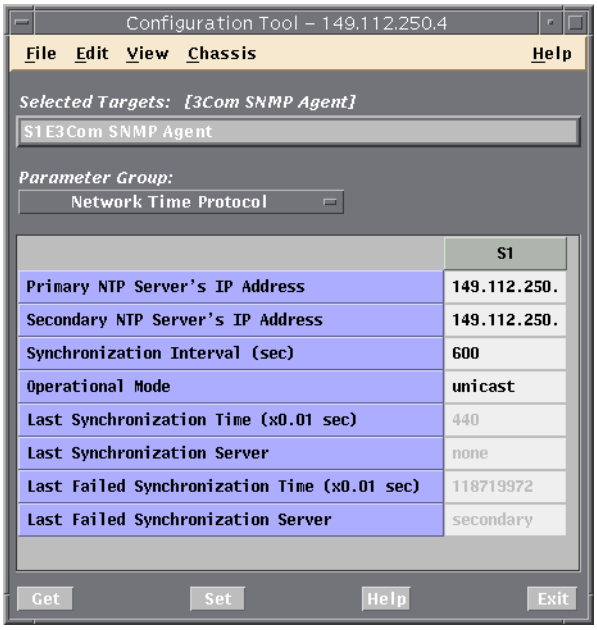
4 Select **3Com SNMP Agent** from the Select Entity drop-down list.

5 Click **OK**.

6 Select **Network Time Protocol**.

A window similar to the following appears:

Figure 3 Server Network Time Protocol Window



7 Enter the Primary and Secondary NT IP addresses (refer to Recording the NTP IP Addresses).

8 Set the Operational Mode to **Unicast**.

9 Click **Set**.

10 Click **Exit**.

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Auto Response

AutoResponse lets network managers define a set of actions (auto response script) to be taken automatically when a specified event occurs in the chassis. The event may be specific to a particular module (NAC or NMC) in a given slot of the chassis, or specific to a particular entity (such as a single modem channel).

IP Telephony Manager provides a convenient graphical user interface (GUI) for the Network Manager to configure automatic responses to a specified event. It is available on the AutoResponse drop-down menu from the Configure menu.

IP Telephony Manager does not need to be running when an event occurs for the NMC to invoke the appropriate response, because these responses are programmed into the NMC.

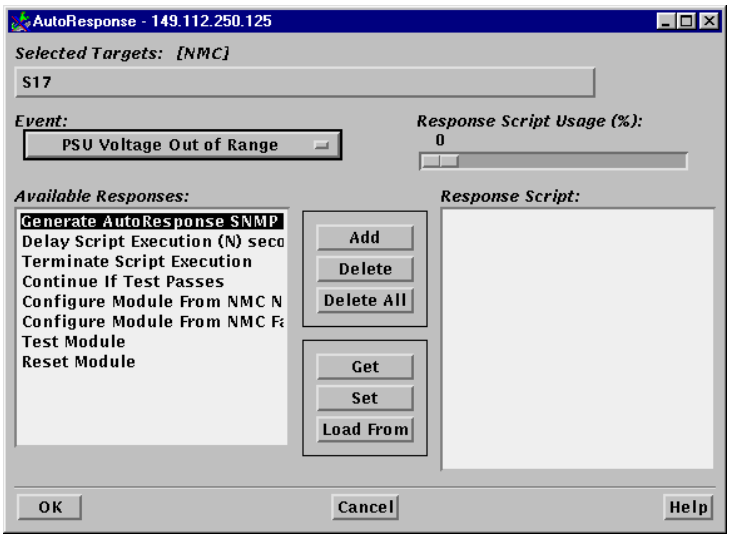
When there are thresholds for an event, they must be programmed through the Configuration Tool. For example, the Connection Time Limit Expired event requires that you specify the Connection Time Limit threshold.

AutoResponse Configuration

To define the automatic responses:

1. Click one or a group of slot(s)/channel(s) on the IP Telephony Manager console window.
2. On the **Main Menu** bar, click **Configuration**, and then click **AutoResponse**.
   - If you selected the edge server card, click **OK** on the Select Entity window. The AutoResponse window appears.
   - If you selected the HiPer DSP card, select where you want the auto response to be set, either the card or template level and click **OK**.
   - The AutoResponse window appears.

Figure 4 AutoResponse Window



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3 Select the event from the Event drop-down list.

4 Select what you want the system to do when the selected event occurs from the Available Responses list and click **Add**.

The response is added to the Responses Configured list box.

5 Click **OK**.

The response scripts are loaded.

Responses can only be added one at a time. Some responses may require additional information (for example, Delay N. Seconds). For responses that require additional input (a descriptor), the AutoResponse Parameters window displays.

Setting Authorized Stations

The chassis Network Management Card (NMC) contains an authorized access list that lets you limit management capability to specific management stations on your network. After you have created entries in the authorized access list, only those management stations can send SNMP requests to that device.

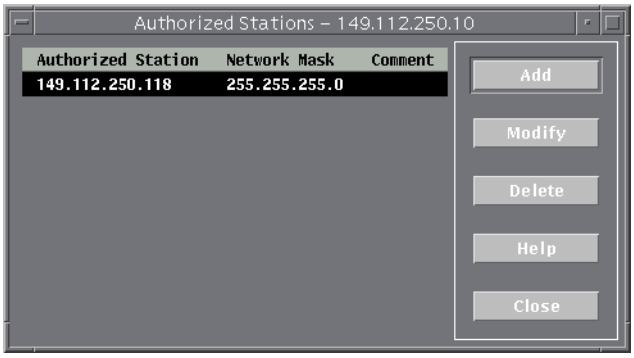
To set up an authorized access list:

1 Open a console window for the device whose authorized access list you want to change.

2 From the **Security** menu, select **Authorized Stations**.

The Authorized Stations window appears.

Figure 5 Authorized Stations Window



3 From the Authorized Stations Add window, click **Add**.

The Authorized Stations Add dialog box appears.

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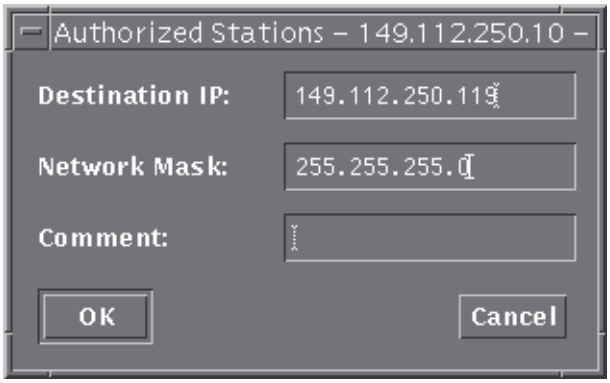
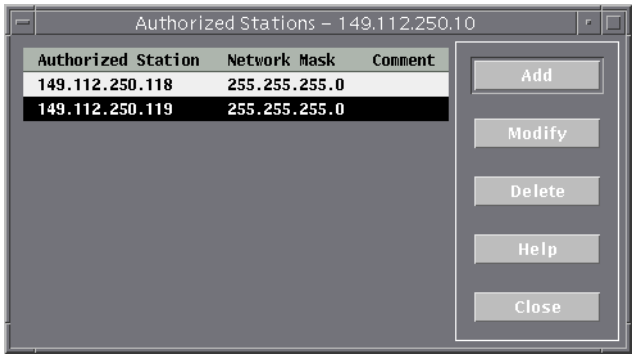
Figure 6 Authorized Stations Add Window



4 In the Add dialog box, enter the IP address for the workstation you are currently working from and click **OK**.

The Authorized Stations Completion window appears with the newly added IP addresses listed.

Figure 7 Authorized Station Completion Window



For information about setting the network mask, refer to Defining a Range of IP Addresses for Authorized Access later in this chapter.

5 Click **Add** to add additional entries for other workstations you want to grant management access.

6 Repeat these steps for each device on your network.

7 If you changed the authorized stations on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities in Chapter 4 for more information.

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Defining a Range of IP Addresses for Authorized Access

You can define a range of IP addresses for authorized access by using the Network Mask field in the authorized access list.

The network mask that you type in this field masks the IP address for that entry to define a range of authorized IP addresses.

For example, a network mask of 255.255.255.255 prevents access from all IP addresses except the destination IP address. An entry with a destination IP address of 139.78.202.192 and a network mask of 255.255.0.0 grants access to all stations with IP addresses within the range of 139.78.0.0 and 139.78.255.255. An entry with the same IP address and a network mask of 255.0.0.0 grants access to all stations with an IP address beginning with 139.

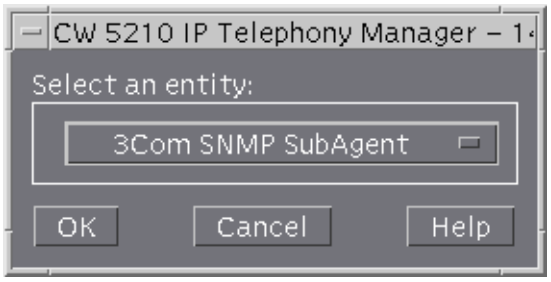
Threshold Monitoring Configuration

Threshold monitoring provides local *monitoring* of any MIB object's value and establishes threshold levels for which events can be generated. You can select which objects to monitor and designate the threshold levels. Threshold values can be provisioned independently to issue events if the actual values cross the thresholds. This is different from trap filtering which describes how to configure the *frequency* of the traps. This, instead, places thresholds on certain performance *parameter values* and issues a trap when the threshold is exceeded.

To set threshold monitoring from IP Telephony Manager:

1. Open a console window for the device where the threshold is going to be set. (For the Media Gateway, you need to select the edge server card.)
2. From the **Configuration** menu, click **Programmed Settings**.
3. Select the **3COM SNMP SubAgent** from the Select Entity window (For Back-end Servers and the Gatekeeper, select **3Com SNMP Agent**.) and click **OK**.

Figure 8 Selecting an Entity Window



4. From the Parameter Group Selection window, select **Threshold Monitor Configuration**.

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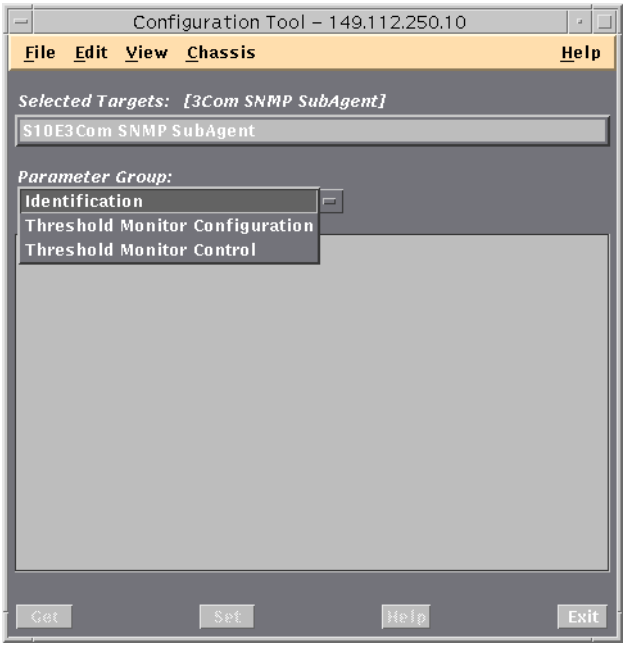
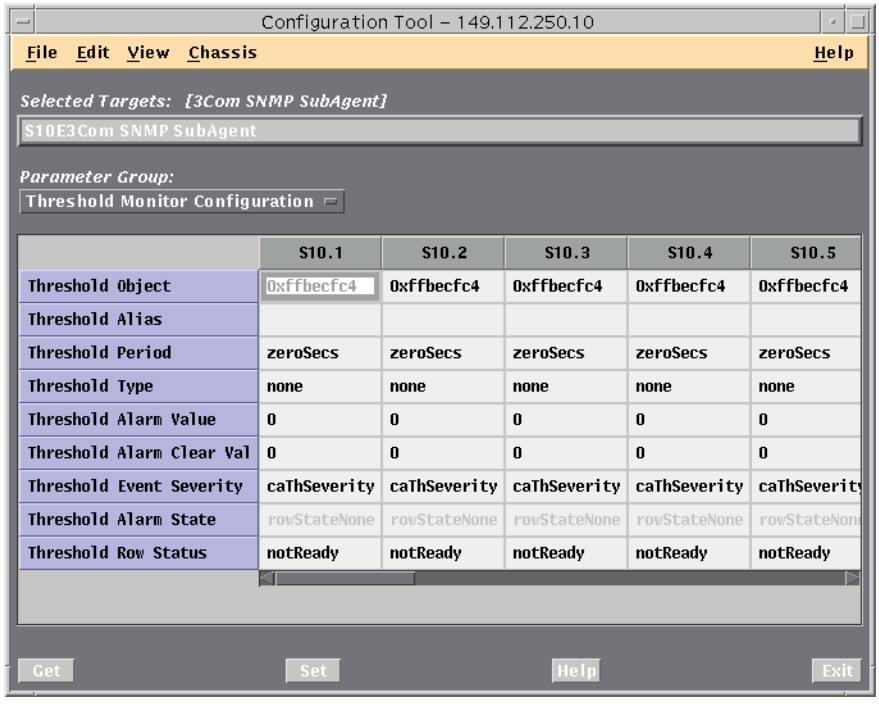
Figure 9 Parameter Group Selection Window



The Threshold Monitor Configuration window appears.

Figure 10 Configuring Thresholds Window


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [3Com SNMP SubAgent]
S10E3Com SNMP SubAgent
Parameter Group:
Threshold Monitor Configuration
S10.1 S10.2 S10.3 S10.4 S10.5
Threshold Object 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4
Threshold Alias
Threshold Period zeroSecs zeroSecs zeroSecs zeroSecs zeroSecs
Threshold Type none none none none none
Threshold Alarm Value 0 0 0 0 0
Threshold Alarm Clear Val 0 0 0 0 0
Threshold Event Severity caThSeverity caThSeverity caThSeverity caThSeverity caThSeverity
Threshold Alarm State rowStateNone rowStateNone rowStateNone rowStateNone rowStateNone
Threshold Row Status notReady notReady notReady notReady notReady
Get
Set
Help
Exit

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The following table contains the fields and the values of the Configuring Threshold window.

Table 8 Threshold Monitor Configuration Fields

Field Name	Description	Possible Selections
Threshold Object	Object ID which is to be monitored. This has 4294967294 at the end if an object with multiple instances is to be monitored.	Example: 1.3.6.1.4.1.429.4.75.5.1.8.0
Threshold Alias	Alias for the object ID. This is used to differentiate the different objects being monitored. The alias is sent in the threshold trap for identifying the monitor object that has crossed the threshold or cleared the threshold	The alias has to be unique across all objects to be monitored.
Threshold Period	Frequency at which this parameter is monitored.	0 sec 15 sec 30 sec 1 minute 15 minutes 30 Minute
Threshold Type	Type of the collection.	None Delta: The difference between the start and the end of the period is used. Absolute: The actual value is used
Threshold Alarm Value	Threshold, which if crossed, results in a trap	An integer value. If you set the Threshold Type to Absolute, a trap is sent when the current value is greater than the integer value you entered. If you set the Threshold Type to Delta, a trap is sent when the delta of the threshold period is greater than the integer value you entered.
Threshold Alarm Clear Value	Threshold, which if crossed in the reverse direction, results in a threshold clear trap	An integer value. If you set the Threshold Type to Absolute, a clear trap is sent when the current value is less than the integer value you entered. If you set the Threshold Type to Delta, a clear trap is sent when the delta of the threshold period is less than the integer value you entered.

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Table 8 Threshold Monitor Configuration Fields (continued)

Field Name	Description	Possible Selections
Threshold Event Severity	The severity configured will be sent in the trap.	None Critical Warning Informational
Threshold Alarm State	State of the threshold object. If an object is not active, then it has a state of none. If an object is above threshold, then this object will show that state. If an Object has cleared the threshold, then it will show that state. If an object is not a part of the CommonAgent, the thresholdState will become invalid. If an object is not internally accessible, then it will have a state of Inaccessible. This is a read-only column.	None Invalid Warning Critical Clear Inaccessible Information
Threshold Row Status	Status of the threshold object. This is a user-defined entry that is used to create rows in the table. The state rowstate can itself be only active, notReady, notInService. A rowState of notReady implies that one or more parameters of the row haven't been set to the correct value. A row in the underCreation state can be set to active state.	Active CreateAndWait notInService destroy notReady createAndGo

5 After you have set the trap thresholds on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities in Chapter 4 for more information.

Adding a Threshold Parameter

To add a parameter to monitor:

1 Open a console window for the device where the threshold parameter is going to be added. (For the Media Gateway, you need to select the edge server card.)

2 From the **Configuration** menu, click **Programmed Settings.**

3 Select the **3COM SNMP SubAgent** from the Select Entity window (For Back-end Servers and the Gatekeeper, select **3Com SNMP Agent**.) and click **OK**.

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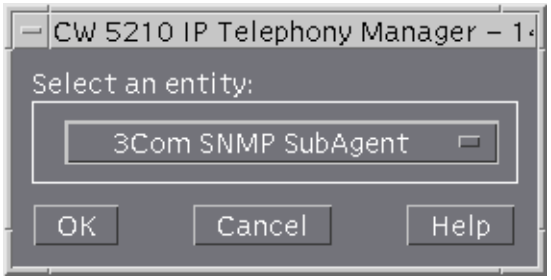
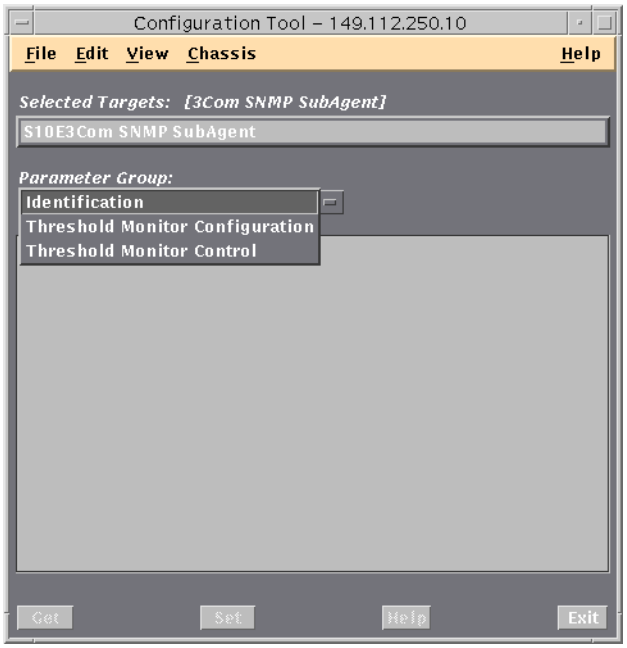
Figure 11 Selecting an Entity Window



4 From the Parameter Group Selection window, select **Threshold Monitor Configuration**.

Figure 12 Parameter Group Selection Window



The Threshold Monitor Configuration window appears.

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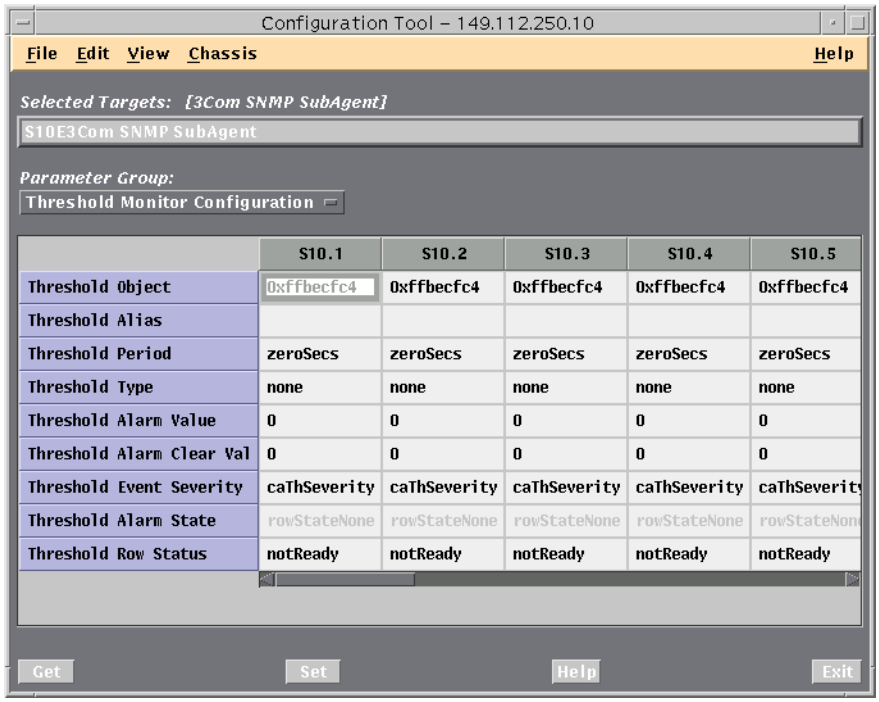
Figure 13 Configuring Thresholds Window


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [3Com SNMP SubAgent]
S10E3Com SNMP SubAgent
Parameter Group:
Threshold Monitor Configuration
S10.1 S10.2 S10.3 S10.4 S10.5
Threshold Object 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4
Threshold Alias
Threshold Period zeroSecs zeroSecs zeroSecs zeroSecs zeroSecs
Threshold Type none none none none none
Threshold Alarm Value 0 0 0 0 0
Threshold Alarm Clear Val 0 0 0 0 0
Threshold Event Severity caThSeverity caThSeverity caThSeverity caThSeverity caThSeverity
Threshold Alarm State rowStateNone rowStateNone rowStateNone rowStateNone rowStateNone
Threshold Row Status notReady notReady notReady notReady notReady
Get Set Help Exit

5 Configure the fields in the Configuring Threshold window as needed. Refer to Table 8. Click **Set**.

6 Set **Threshold Row Status** to **createAndGo**. As shown in the following figure.

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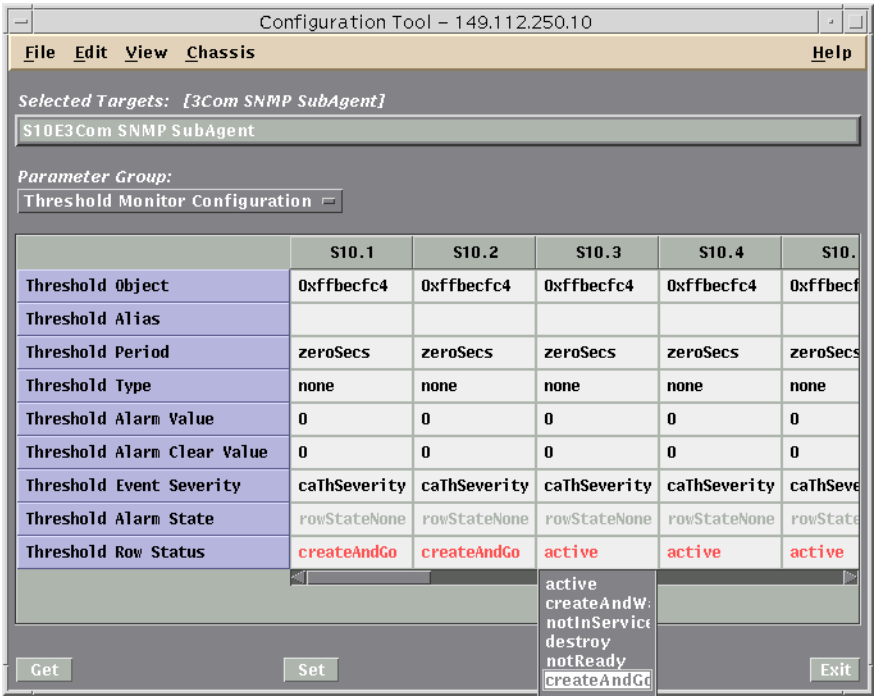
Figure 14 Adding Threshold Parameters Window


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [3Com SNMP SubAgent]
S10E3Com SNMP SubAgent
Parameter Group:
Threshold Monitor Configuration
S10.1 S10.2 S10.3 S10.4 S10.
Threshold Object 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecf
Threshold Alias
Threshold Period zeroSecs zeroSecs zeroSecs zeroSecs zeroSecs
Threshold Type none none none none none
Threshold Alarm Value 0 0 0 0 0
Threshold Alarm Clear Value 0 0 0 0 0
Threshold Event Severity caThSeverity caThSeverity caThSeverity caThSeverity caThSeve
Threshold Alarm State rowStateNone rowStateNone rowStateNone rowStateNone rowState
Threshold Row Status createAndGo createAndGo active active active
active
createAndW:
notInServic
destroy
notReady
createAndGo
Get
Set
Exit

7 Click **Set**.

8 If you changed the threshold parameters on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities in Chapter 4 for more information.

Editing a Threshold Parameter

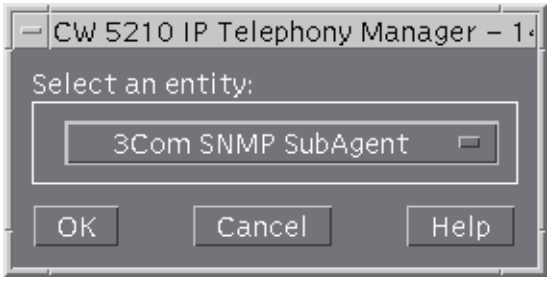
To edit a parameter that is being monitored:

1 Open a console window for the device where the threshold is going to be edited. (For the Media Gateway, you need to select the edge server card.)

2 From the **Configuration** menu, click **Programmed Settings.**

3 Select the **3COM SNMP SubAgent** from the Select Entity window (For Back-end Servers and the Gatekeeper, select **3Com SNMP Agent**.) and click **OK**.

Figure 15 Selecting an Entity Window



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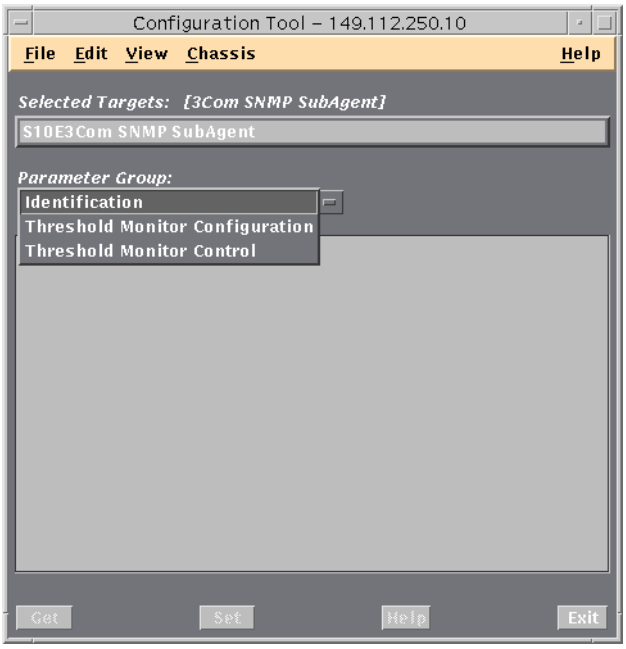
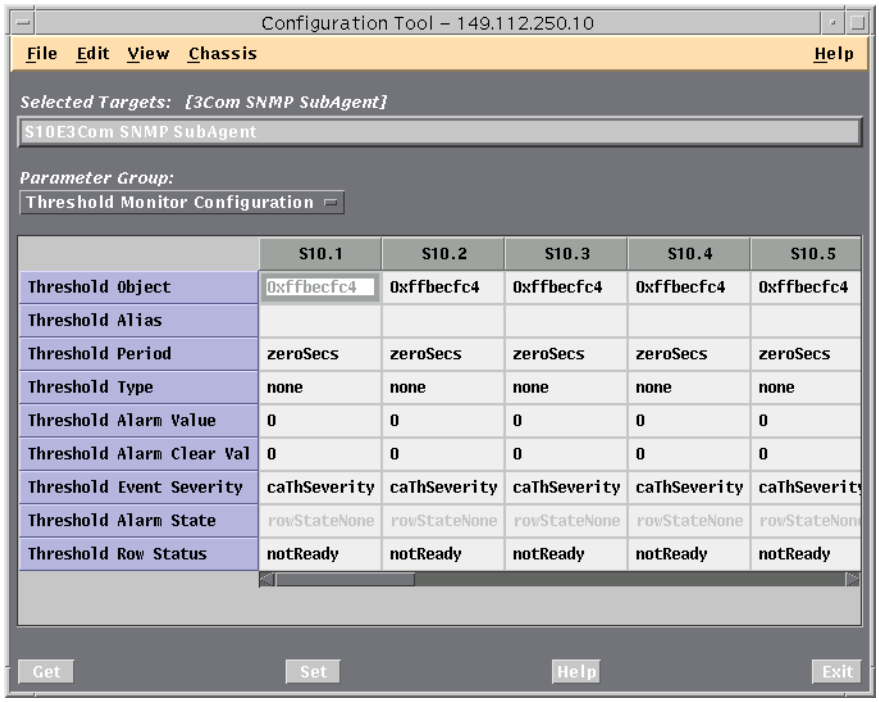
4 From the Parameter Group Selection window, select **Threshold Monitor Configuration**.

Figure 16 Parameter Group Selection Window



The Threshold Monitor Configuration window appears.

Figure 17 Configuring Thresholds Window


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [3Com SNMP SubAgent]
S10E3Com SNMP SubAgent
Parameter Group:
Threshold Monitor Configuration
S10.1 S10.2 S10.3 S10.4 S10.5
Threshold Object 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4
Threshold Alias
Threshold Period zeroSecs zeroSecs zeroSecs zeroSecs zeroSecs
Threshold Type none none none none none
Threshold Alarm Value 0 0 0 0 0
Threshold Alarm Clear Val 0 0 0 0 0
Threshold Event Severity caThSeverity caThSeverity caThSeverity caThSeverity caThSeverity
Threshold Alarm State rowStateNone rowStateNone rowStateNone rowStateNone rowStateNone
Threshold Row Status notReady notReady notReady notReady notReady
Get
Set
Help
Exit

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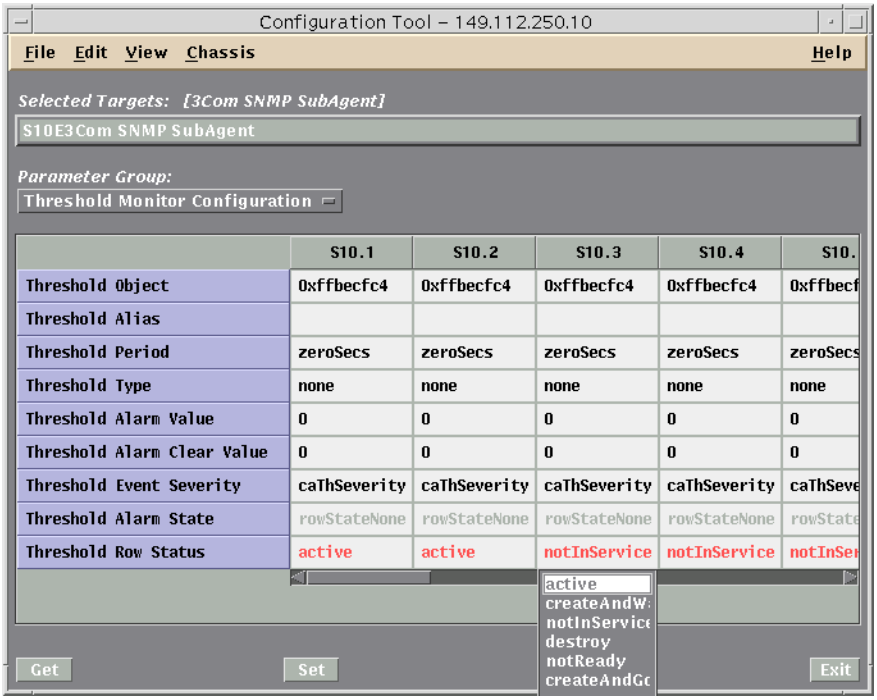
5 Set **Threshold Row Status** to **notinsservice**.

6 Change the configuration as you need, refer to Table 8, and click **Set**.

7 Set the Threshold Row Status to **active**.

The following figure shows the Threshold Parameter drop-down list.

Figure 18 Editing Threshold Parameters Window


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [3Com SNMP SubAgent]
S10E3Com SNMP SubAgent
Parameter Group:
Threshold Monitor Configuration
S10.1 S10.2 S10.3 S10.4 S10.
Threshold Object 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecfc4 0xffbecf
Threshold Alias
Threshold Period zeroSecs zeroSecs zeroSecs zeroSecs zeroSecs
Threshold Type none none none none none
Threshold Alarm Value 0 0 0 0 0
Threshold Alarm Clear Value 0 0 0 0 0
Threshold Event Severity caThSeverity caThSeverity caThSeverity caThSeverity caThSeve
Threshold Alarm State rowStateNone rowStateNone rowStateNone rowStateNone rowState
Threshold Row Status active active notInService notInService notInSer
active
createAndW
notInServic
destroy
notReady
createAndGc
Get
Set
Exit

8 Click **Set**.

9 If you changed the threshold parameters on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities in Chapter 4 for more information.

Threshold Traps

IP Telephony Manager issues the following traps depending on the Threshold event severity configured:

- Threshold Warning
- Threshold Critical
- Threshold Informational
- Threshold Warning Clear
- Threshold Critical Clear
- Threshold Informational Clear

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Saving and Restoring Configurations

The Save configuration utility performs a discovery of the configuration of a device and saves it to a file. After it is saved to a file, the Restore configuration utility is used to restore the configuration to that device, or it can be used to apply the file to other devices with similar components.

You can initiate a device save or restore in any of the following ways:

- From the File menu of the IP Telephony Manager Console
- From your network management platform (HP OpenView). For information on how to save and restore a device from your network management platform, refer to your network management User Guide.
- From the UNIX command line. For information on saving and restoring operations from the command line, refer to Appendix B, Command Line Interface

There are four ways to save configurations:

- **Saving a Chassis Configuration to NVRAM—**The Media Gateway configuration can be saved to a file on the network.
- **Component Save to NVRAM—**Most components contain their own nonvolatile read access memory (NVRAM). The Media Gateway's current configuration can be saved to its NVRAM and later retrieved through a direct command or by resetting the component.
- **NMC Save Chassis to NVRAM—**An entire device's configuration can be saved to the NMC NVRAM.
- **Saving Chassis Configurations from CFM—**This feature lets you save the configurations of every component of a device to a file (for example, the configuration of all the cards and channels in a chassis, and the servers).

There are two ways to restore the configurations:

- **Restoring a Chassis Configuration from NVRAM**—An entire device's configuration can be restored from a file on the network.
- **Restoring Chassis Configurations from CFM—**This feature lets you restore the configurations of every component of a device from a file (for example, the configuration of all the cards and channels in a chassis and the servers). The device configuration can be restored to that device, or applied to other devices with similar components.

Saving a Chassis Configuration to NVRAM

Use the following procedure to save a Media Gateway chassis configuration to NVRAM using the IP Telephony Manager.

1 From the IP Telephony Manager Console window, select **File** menu, and click **Save Chassis NVRAM**.

The **Save Chassis NVRAM** dialog box appears.

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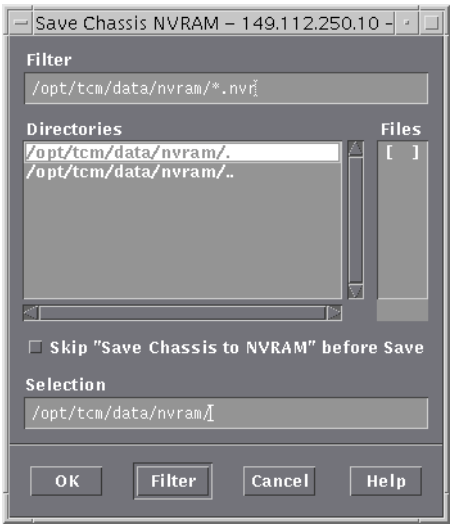
Figure 19 Save Chassis NVRAM Dialog Box



2 Enter or select the .nvr file you are saving to and click **OK**.

The default directory for .nvr files is: $TCMHOME/data/nvram/.

If you are saving or restoring from the command line and you are not using the x prefix option, progress is reported as status messages on screen. For more information, refer to Appendix B, Command Line Interface.

The Chassis Save Progress window appears.

3 When the save is completed, click **OK**.

Restoring a Chassis Configuration from NVRAM

To restore a Media Gateway chassis configuration from NVRAM using IP Telephony Manager:

1 From the IP Telephony Manager Console window, select **File** menu, and click **Restore Chassis NVRAM**.

The **Restore Chassis NVRAM** dialog box appears.

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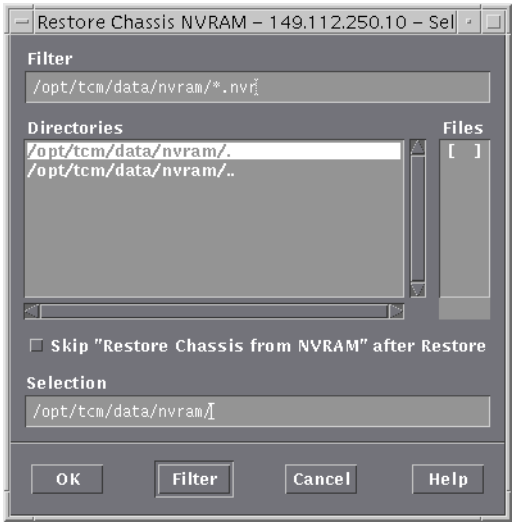
Figure 20 Restore Chassis NVRAM Dialog Box



2 Enter or select the .whb file you are restoring from and click **OK**.

The default directory for .nvr files is: $TCMHOME/data/nvram/.

If you are saving or restoring from the command line and you are not using the x prefix option, progress is reported as status messages on screen. For more information refer to Appendix B, Command Line Interface.

The Chassis Restore Progress window appears.

3 When the restore is completed click **OK**.

Component Save to NVRAM

Some device components, such as modems, store their settings in their own NVRAM and use them for power-on and reset defaults.

To save a component's settings to NVRAM:

1 Select the component whose configuration you are saving on the IP Telephony Manager console display.

2 Select **Configuration** from the IP Telephony Manager Console window.

3 Select **Action/Commands** from the drop-down menu.

4 Click the **Card Level** radio button.

5 Select **Software** in the Category box.

6 Select **Both T1/E1 and Modem to NVRAM** in the Command to Execute box.

To load a component's NVRAM settings, issue the Restore from NVRAM command from the same command group as the Save to NVRAM command.

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Not all components support the Save to NVRAM feature. For those that support this feature, the HIPer DSP and NMC cards, you must select the right command type and group. For example, the modem software command group is available only when you select modems at the channel level, as opposed to selecting the whole card. For T1 cards, you must select the whole card and choose the software command group. Refer to Appendix C for a list of available commands for each type of IP Telephony Manager component.

NMC Save Chassis to NVRAM

Use the Save Chassis to NVRAM command to save the configuration of each component in a device to the NMC's NVRAM. You can then restore this configuration to that device by using the Restore Chassis from NVRAM command.

To execute the Save Chassis to NVRAM and Restore Chassis from NVRAM commands, follow this procedure:

1. Select the NMC card (or management module) from the IP Telephony Manager console window.
2. Select **Actions/Commands** from the **Configuration** menu.

   The Command window appears.
3. Select **Save Chassis from NVRAM** or **Restore Chassis from NVRAM** from the **Command to Execute** drop-down box.
4. Click **Execute**, and wait for the Success result.

Saving Configurations to the CFM

Use the following procedure to save the configuration of the Media Gateway chassis, Gatekeeper, SIP Proxy Server, or Back-end Server to the Configuration File Manager (CFM) using the IP Telephony Manager.

1. From the IP Telephony Manager Console window, select **File** menu, and click **Save CFM**.

   The **Save CFM** dialog box appears.
2. When the save is completed, click **OK**.

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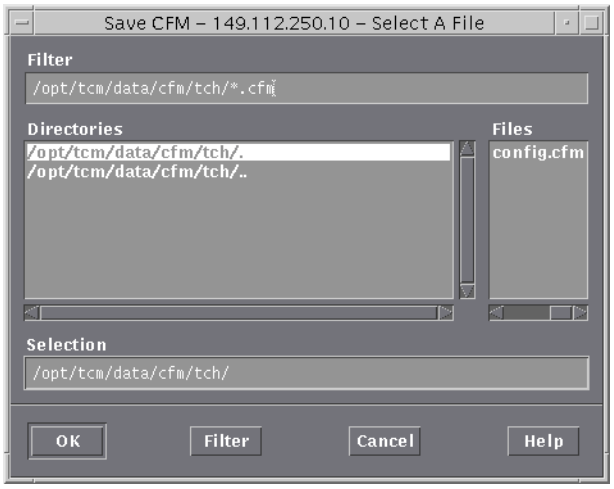
Figure 21 Save Chassis CFM Dialog Box



3 Enter or select the .cfm file you are saving to and click **OK**.

The default directory for .nvr files is: $TCMHOME/data/nvram/.

If you are saving or restoring from the command line and you are not using the x prefix option, progress is reported as status messages on screen. For more information refer, to Appendix B, Command Line Interface.

The Chassis Save Progress window appears.

4 When the save is completed, click **OK**.

Restoring a Configuration from CFM

Use the following procedure to restore the configuration of the Media Gateway chassis, Gatekeeper, SIP Proxy Server, or Back-end Server to the Configuration File Manager (CFM) using the IP Telephony Manager.

1 From the IP Telephony Manager Console window, select **File** menu, and click **Restore CFM**.

The **Restore CFM** dialog box appears.

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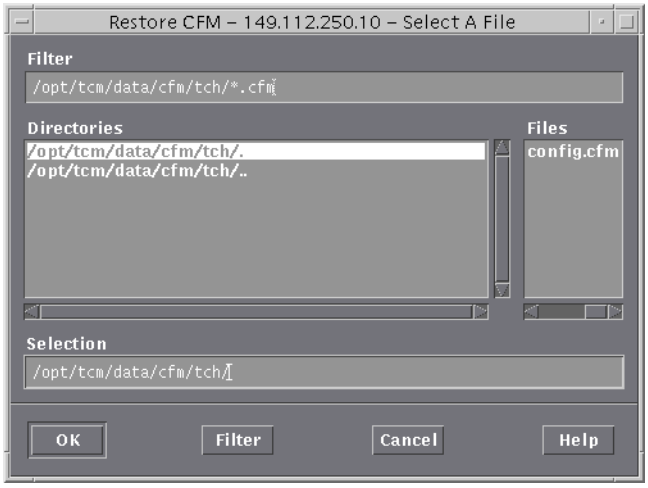
Figure 22 Restore Chassis CFM Dialog Box



2 Enter or select the .cfm file you are restoring from and click **OK**.

The default directory for .cfm files is: opt/tcm/data/cfm/tch.

If you are saving or restoring from the command line and you are not using the x prefix option, progress is reported as status messages on screen. For more information, refer to Appendix B, Command Line Interface.

The Chassis Restore Progress window appears.

3 When the save is completed, click **OK**.

4 Restart the SIP Proxy server to ensure that the Back-end server addresses from the restore are used. Refer to the *CommWorks 4220 SIP Proxy Server Guide* for more information on restarting the SIP Proxy server.

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3 Navigating and Using the System

This chapter describes the menus in the IP Telephony Manager. The function of the menus can vary depending on the component, if that is the case, then you are referred to that individual component's user manual.

This chapter contains the following topics:

- Accessing IP Telephony Manager Window
- File Menu
- View Menu
- Configuration Menu
- Fault Menu
- Performance Menu
- Security Menu

As an example, the descriptions in this section pertain to the CommWorks IP Telephony Media Gateway. The server menus are similar to the windows described here.

Accessing IP Telephony Manager Window

There are two main menus in the IP Telephony Manager. One is for the Media Gateway chassis and the other one is for the Back-end Server(s), Gatekeeper, or SIP Proxy Server.

To access the either main menu, from the command line prompt, type one of these commands:

```
# xtcmvfpd
```

or

```
# xtcmvfpd <target chassis IP address>
```

The first command lists the chassis components. You then select the component that you want to start. The second command, you specify the IP address of the component that you want to start.

If the Media Gateway was specified:

The IP Telephony Manager Console window appears.

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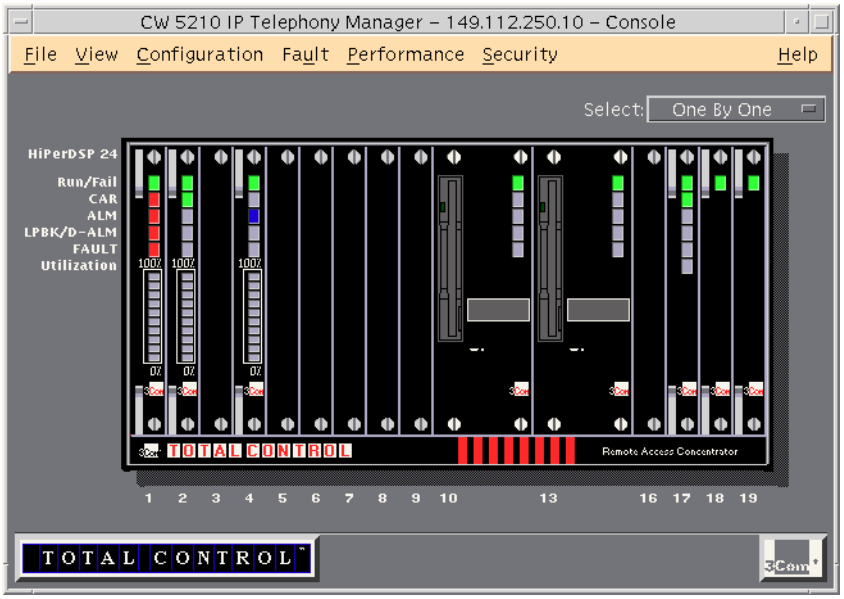
Figure 23 IP Telephony Manager Console Window



The IP Telephony Manager Console window contains a graphical representation of the Total Control chassis. The view can be changed by the View menu to see the front or back of the chassis. Select the area of the chassis on the IP Telephony Manager Console window on which you want the function to be performed, then select the function from the main menu bar.

In general:

- Click on LEDs to select individual channels or entities, or the area just outside the LEDs to select the whole card. For Network Interface Cards (NICs), click the connectors.
- The card's identity appears to the left of the IP Telephony Manager Console window.
- To select more than one channel or entity at a time, hold down the Shift key.
- You can select only one type of card at a time (for example, you can select two HiPer DSP Modem cards, but not a HiPer DSP card and some other type of modem card).
- To select all the same type of channels or components in a card, use the All Like Devices setting in the Select drop-down box at the upper right corner of the IP Telephony Manager Console window.

If a Gatekeeper, SIP Proxy Server, or a Back-end Server was selected:

The IP Telephony Manager Server window appears.

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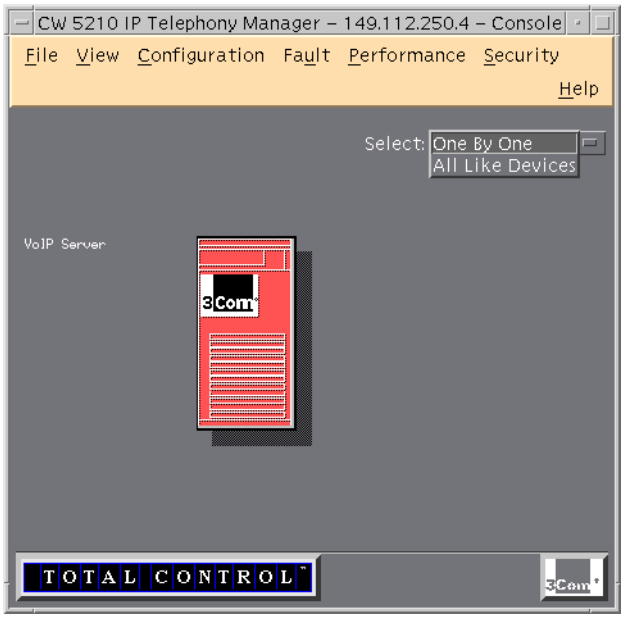
Figure 24 IP Telephony Manager Server Window



To perform a function on the Gatekeeper, SIP Proxy Server, or Back-end Server, click on the server icon and simply choose the command from the main menu.

The remainder of this section describes the functions located on the main menu.

As you can see, the Chassis Console window and the Server windows contain the same menu items. For ease of reference, the IP Telephony Manager Console windows are used as examples. It is noted when a drop-down submenu is for the IP Telephony Manager Chassis Console only.

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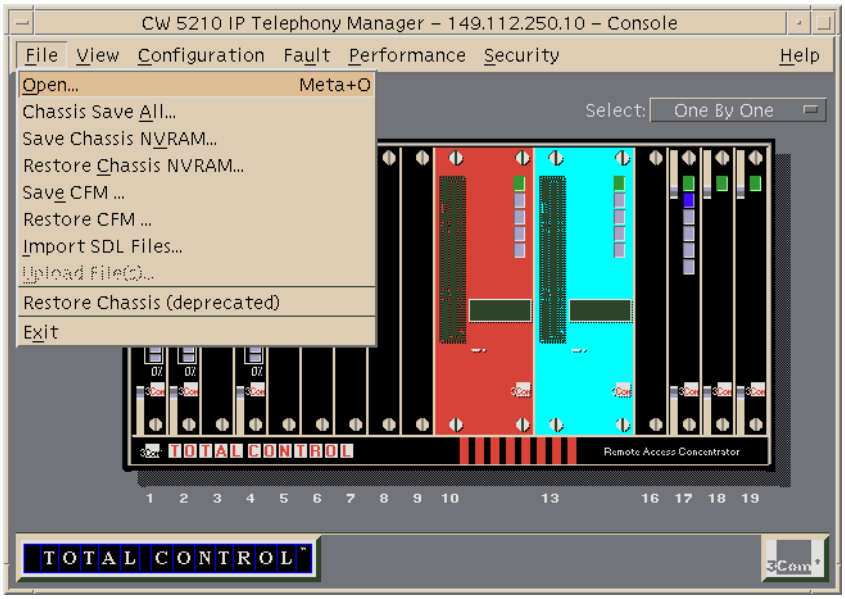
File Menu

The file menu is used to open devices on the system, save and restore configurations, and to import Software download files.

Figure 25 shows an example of the File menu from the Media Gateway.

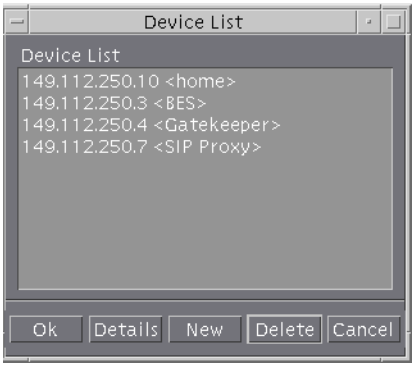
Figure 25 File Menu



Open Submenu

The Open submenu displays the Device List window. It lets you to access other devices on your VoIP system.

Figure 26 Device List Window



Chassis Save All Submenu

The Chassis Save All submenu saves to entire chassis' configuration to NVRAM (IP Telephony Manager Chassis Console only).

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Save Chassis NVRAM Submenu

The Save Chassis NVRAM submenu saves the Media Gateway chassis configuration to a specific file on NVRAM. Refer to Chapter 2 for more information on saving the chassis to NVRAM (IP Telephony Manager Chassis Console only).

Restore Chassis NVRAM Submenu

The Restore Chassis NVRAM submenu restores the Media Gateway chassis configuration from a specified file. You can also use this submenu to configure another chassis by using the configuration saved on this file. Refer to Chapter 2 for more information about restoring the Media Gateway chassis configuration (IP Telephony Manager Chassis Console only).

Save CFM Submenu

The Save CFM Submenu saves the chassis or server configuration to a specified Configuration File Management (CFM) file. Refer to Chapter 2 for more information about saving the Media Gateway chassis or the server from a CFM file.

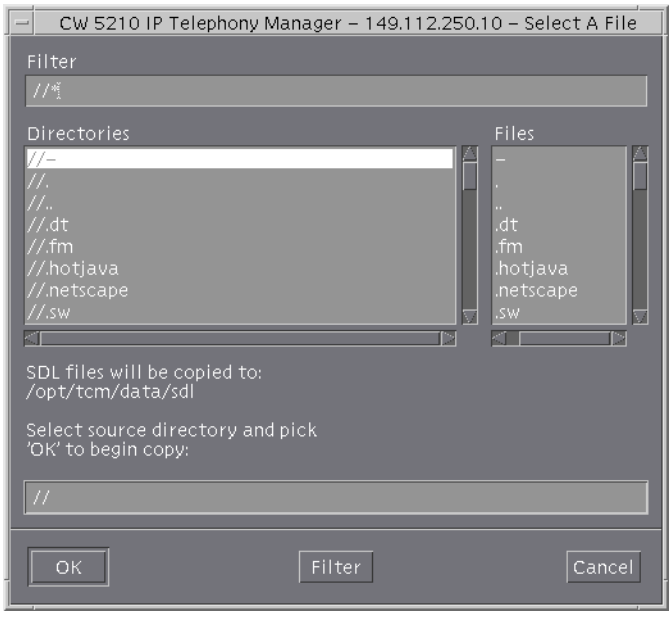
Restore CFM Submenu

The Restore CFM submenu restores the chassis or server configuration by using a specified CFM file. Refer to Chapter 2 for more information on restoring the Media Gateway chassis or the server from a CFM file.

Import SDL Files Submenu

The Import SDL Files submenu copies the Software Download (SDL) files to a specified directory. Refer to Chapter 4 for more information on upgrading your system using the Software Download menu (IP Telephony Manager Chassis Console only).

Figure 27 Software Download Window



Exit Submenu

The Exit submenu closes the current IP Telephony Manager session.

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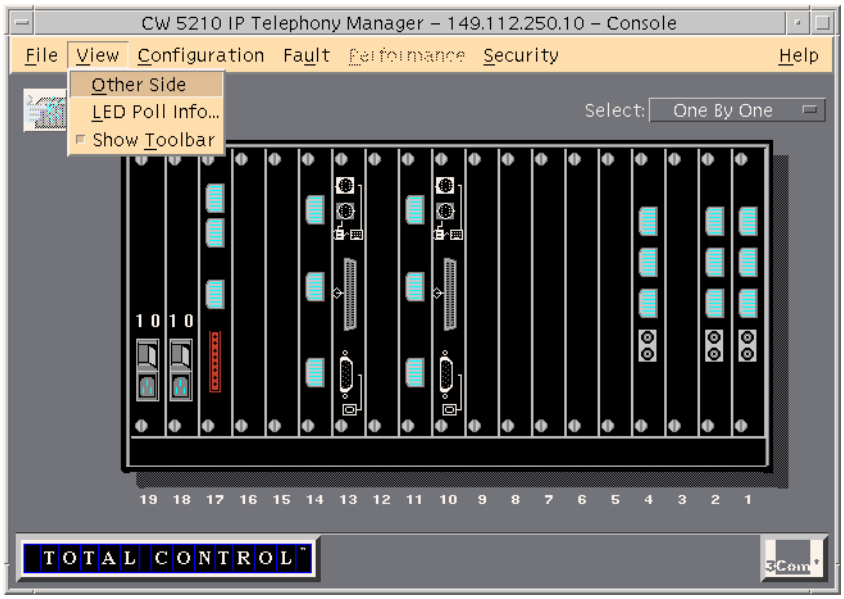
View Menu

The View menu lets you adjust the way IP Telephony Manager displays the console or server window.

Figure 28 View Menu



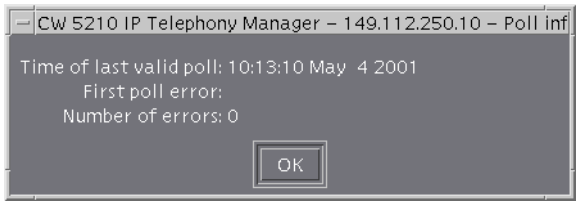
Other Side Submenu

The Other Side submenu displays the reverse side of the chassis. This guide shows the front panel of the chassis. Figure 28 shows the back of the Media Gateway chassis (IP Telephony Manager Chassis Console only).

LED Poll Info Submenu

The LED Poll Info submenu displays the status of the LED lights.

Figure 29 LED Poll Info Window


CW 5210 IP Telephony Manager – 149.112.250.10 – Poll inf
Time of last valid poll: 10:13:10 May 4 2001
First poll error:
Number of errors: 0
OK

Show Toolbar Submenu

The Show Toolbar submenu displays four icons.

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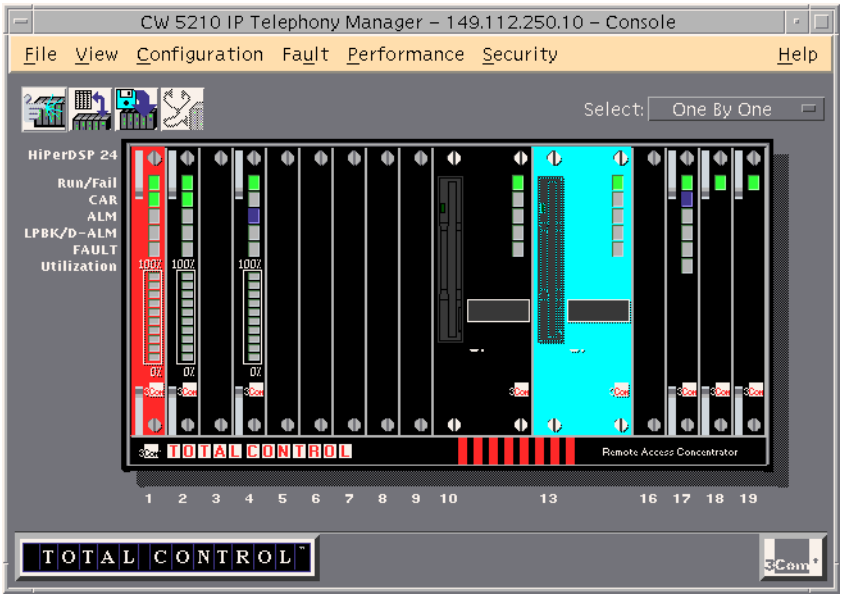
Figure 30 Icon View Window



The first icon displays the Command Tool dialog box for the chosen entity.

The second icon displays the Configuration menus.

The third icon displays the software download dialog box for the selected entity.

The forth icon displays diagnostics information for the selected entity.

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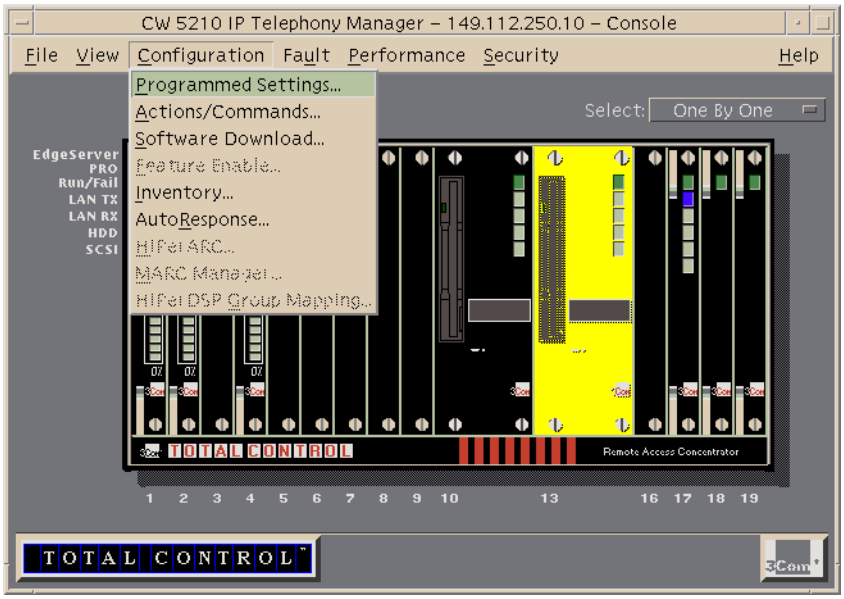
Configuration Menu

The Configuration menu is used to set the VoIP chassis to your environment requirements.

Figure 31 Configuration Menu



Programmed Settings Submenu

The Programmed Settings submenu displays the Configuration Tool window for the selected entity. Parameters for a given component may be divided into several groups. When you select the Configuration Tool, the Parameter Group drop-down box appears, prompting you to select a parameter group. You must select a group from the Parameter Group drop-down box to continue.

Figure 32 shows an example of the CommWorks EdgeServer Pro card Parameter Group.

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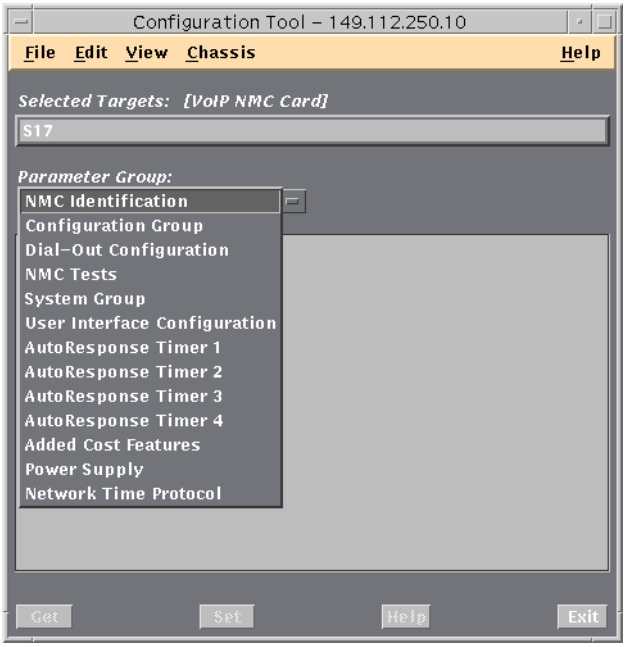
Figure 32 EdgeServer Pro Card Parameter Group Window



The Configuration Tool menu contains the following fields:

- **Selected targets**—The name of the target to be configured from this menu that was selected from the IP Telephony Manager chassis or server.

  Displays the slot and channel numbers of the selected components. For example, S4C1-30 means that channels 1-30 of the component in slot 4 of a device has been selected. This field is read only.

- **Card-Level and Channel-Level Parameter Groups**—IP Telephony Manager components have different parameter groups depending on whether you have selected the whole component or individual channels within a component.

After selecting a parameter group, the configuration table appears, and lists the current settings for each selected component.

Refer to the individual components user guides for information on configuring these parameter groups.

Column headings display slot and channel numbers for each selected component.

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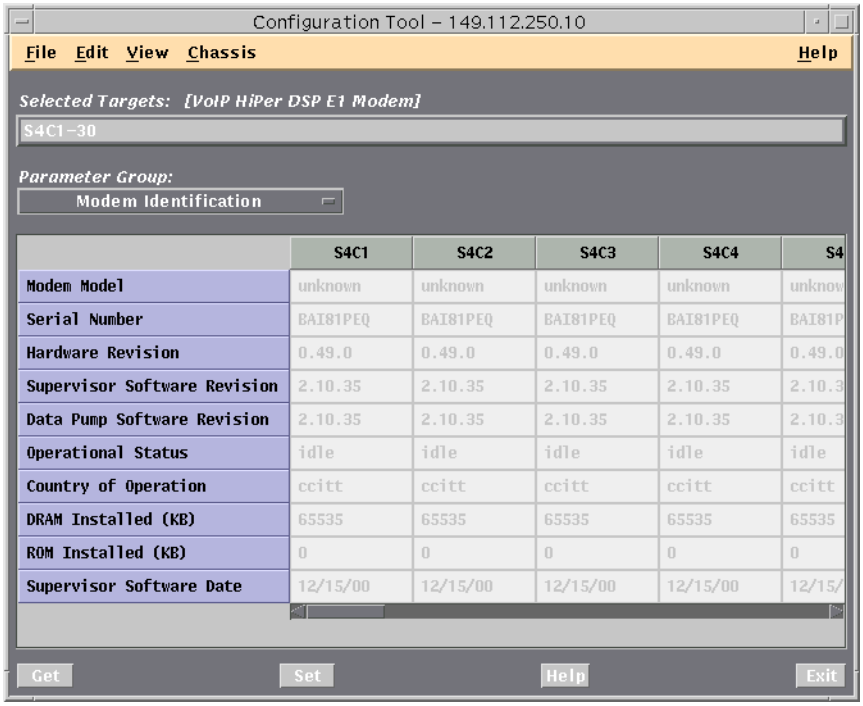
Figure 33 Example of HiPer DSP Modem Identification Configuration Table


Configuration Tool – 149.112.250.10
File Edit View Chassis Help
Selected Targets: [VoIP HiPer DSP E1 Modem]
S4C1-30
Parameter Group:
Modem Identification
S4C1 S4C2 S4C3 S4C4 S4
Modem Model unknown unknown unknown unknown unknow
Serial Number BAI81PEQ BAI81PEQ BAI81PEQ BAI81PEQ BAI81P
Hardware Revision 0.49.0 0.49.0 0.49.0 0.49.0 0.49.0
Supervisor Software Revision 2.10.35 2.10.35 2.10.35 2.10.35 2.10.3
Data Pump Software Revision 2.10.35 2.10.35 2.10.35 2.10.35 2.10.3
Operational Status idle idle idle idle idle
Country of Operation ccitt ccitt ccitt ccitt ccitt
DRAM Installed (KB) 65535 65535 65535 65535 65535
ROM Installed (KB) 0 0 0 0 0
Supervisor Software Date 12/15/00 12/15/00 12/15/00 12/15/00 12/15/
Get Set Help Exit

Click on the cell with the setting you want to edit. If a value is read-only, the cursor changes to the "No" sign when placed over the cell.

If the value can be modified, an arrow appears in the value field. When you click on the field, a drop-down box appears, listing the possible values for the configuration. You can also use the Tab key to navigate through the fields.

After a value has changed in the configuration table, it turns blue (default). The new value is not changed in the component, until you click Set. After a Set is issued and the value is changed in the component, the color returns to normal.

Other fields on the Configuration Tool menu are:

- **Window Title Bar**—Displays the target device IP address.
- **Get Button**—Triggers the SNMP Get operation for the selected parameter group. The Get operation updates the display with the last-saved values.
- **Set Button**—Triggers the SNMP Set operation for the selected parameter group. The Set operation writes the displayed values to the device MIB.
- **Help**—Displays information about configurable parameters. Click on the Help button. The context-sensitive help icon appears. Simply click the parameter/object for which you want additional information. The system launches your HTML browser.

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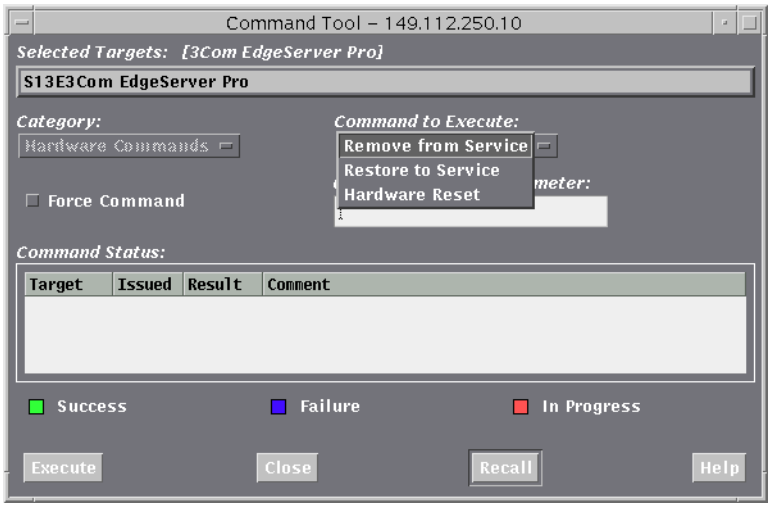
- **Exit**—Closes the window and displays the previous window.
- **Adjusting Column Width**—You can adjust the column width using the mouse. Place the cursor over the column divisor line until it changes to a bar and arrow, then click and drag the line left or right.

Action/Commands Submenu

The Action/Commands submenu displays the Command Tool window for the selected entity.

Figure 34 shows an example of the CommWorks EdgeServer Pro entity.

Figure 34 Command Tool Window



The Command Tool window contains the following fields and control buttons:

- **Selected Targets**—Displays the card type, the slots, and channels that receives the command.
- **Category**—Some cards have different command categories. If the selected targets have only one command category, this box is grayed out.
- **Command to Execute**—Click this box to select the command you want to execute for the selected targets.
- **Force Command**—The card may be in a state where the selected command is normally rejected (for example, a modem in dial mode). Check this box to override this lockout.
- **Command Specific Parameter**—Commands for some device types require an additional parameter to be specified when the command is issued. his parameter is not required for the Total Control chassis.
- **Issued**—Indicates whether or not the command was successfully initiated.
- **Result**—Indicates the results of the last executed command.
- **Comment**—Displays details about failed commands.

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- **Execute**—Executes the selected command for the selected targets.
- **Close**—Closes the Command Tool window.

Software Download Submenu

The Software Download submenu displays the files to be downloaded for the specified entity. You then select the files you need to be downloaded. Refer to Chapter 4 for more information.

Inventory Submenu

The Inventory submenu displays the inventory information for each component on the selected chassis (IP Telephony Manager Chassis Console only).

Figure 35 Inventory Window

The Inventory window contains the following fields:

- **Slot #**—Each entry in the inventory data table is labeled by its slot number in the chassis.
- **Description**—Textual description of the displayed chassis.
- **Serial Number**—Serial number of the component.
- **Product Code**—Hardware product code of the component.
- **Hardware version**—Hardware version of the component.
- **DRAM (KB)**—Amount of dynamic RAM installed in the component.
- **Flash RAM**—Amount of flash RAM installed in the component.
- **DIP Switches**—A bit field value displaying DIP switch settings currently in effect.

  Graphically, the displayed binary corresponds to settings as follows:

  DIP Switch Numbers: 16151413121110987654321

  Bit Field Placeholders: 0000000000000000

  Where a "1" at any of the above positions means that the corresponding DIP switch is ON.

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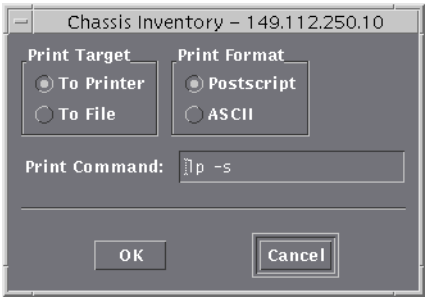
For example, 0000000010010000 means that DIP switches 8 and 5 are ON and all others are off.

- **Software Version**—Version of software currently installed in the component's flash RAM.

You can perform the following tasks from this window:

- **Save**—Saves the inventory data table to an ASCII text file.
- **Exit**—Closes the inventory utility.
- **Print**—Prints displayed data to a printer or file either in postscript or ASCII format. Figure 36 shows the Inventory Print menu.

Figure 36 Inventory Print Menu



The Inventory Print menu contains the following selections:

- Print Target—Selects whether to print to file or print to a printer.
- Print Format—Selects whether to print in postscript format or ASCII text format.
- Print Command—Postscript output is piped to this command. The TCM_PRINT_COMMAND system parameter sets the default.

AutoResponse Submenu

The AutoResponse submenu lets you define what messages need to appear when an event occurs. Refer to Chapter 2 for more information on how to set the auto response messages (IP Telephony Manager Chassis Console only).

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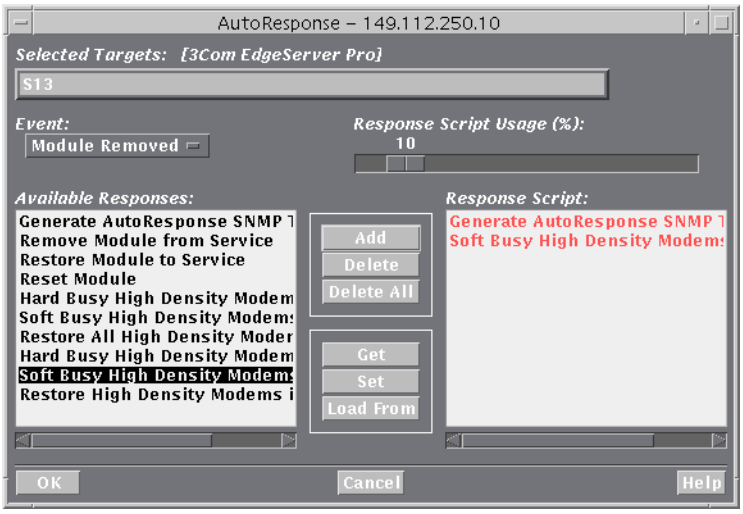
Figure 37 Auto Response Window



The AutoResponse dialog box contains the following fields and buttons:

- **Selected Targets**—This box shows the slot(s) or channel(s) selected in the chassis display.
- **Event**—Click this box to select an event. If you select an event that requires a descriptor, make sure that you have programmed the descriptor.
- **Response Script Usage %**—This indicator shows the percentage of available script space you have programmed. Each response may take up a different amount of script space. Monitor this gauge to avoid programming too many responses to a single event.
- **Available Responses/Response Script**—The responses available for the event appear on the left, and the responses configured for the event appear on the right. Refer to AutoResponse Editing for information about configuring the list. When you select a response that has descriptors, a window of descriptor options appears .
- Add—Assigns the selected response to an event.
- Delete—Removes the selected response.
- Delete All—Removes all the selected responses from the Responses Configured list.
- Get—Queries the NMC for the response script associated with the event.
- Set—Assigns the selected response script to the event.
- Load From—Displays the Load From Device window.

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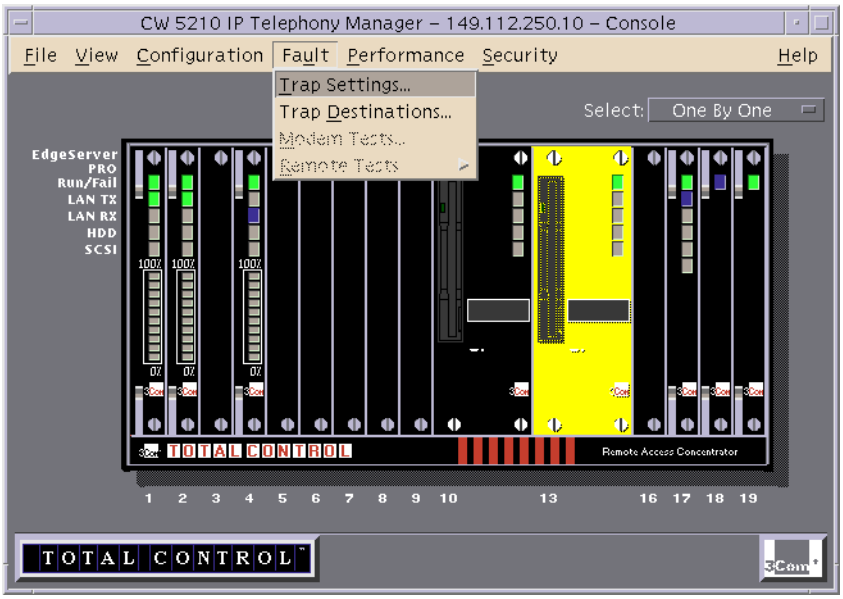
Fault Menu

The Fault menu lets you enable/disable traps and define the trap's destination.

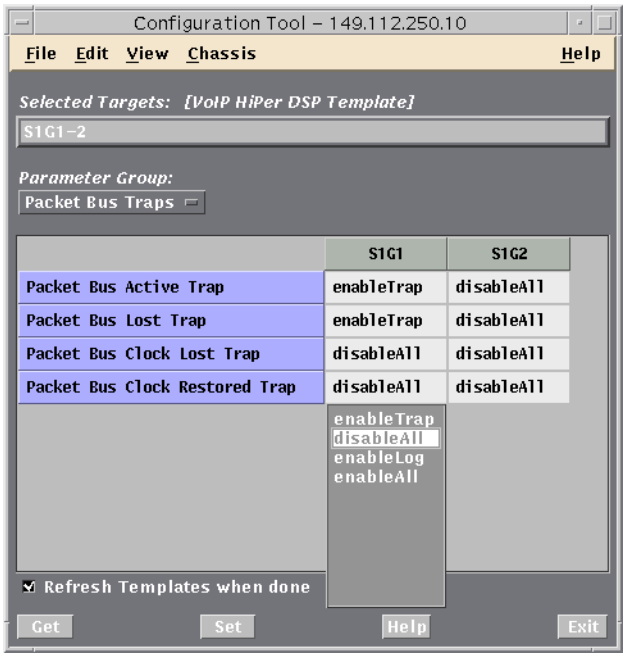
Figure 38 Fault Menu



Trap Settings Submenu

The Trap Setting submenu defines the traps for the specified entity. Refer to the individual component user guide for information about setting this for your VoIP component.

Figure 39 Trap Setting Window



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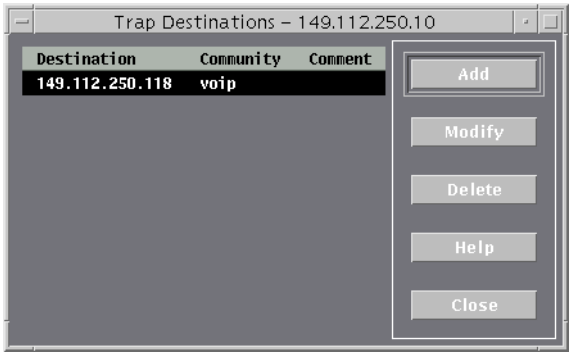
Trap Destination Submenu

The Trap Destination submenu defines and modifies where the traps are sent. Refer to the individual component user guide for information about setting this for your VoIP component.

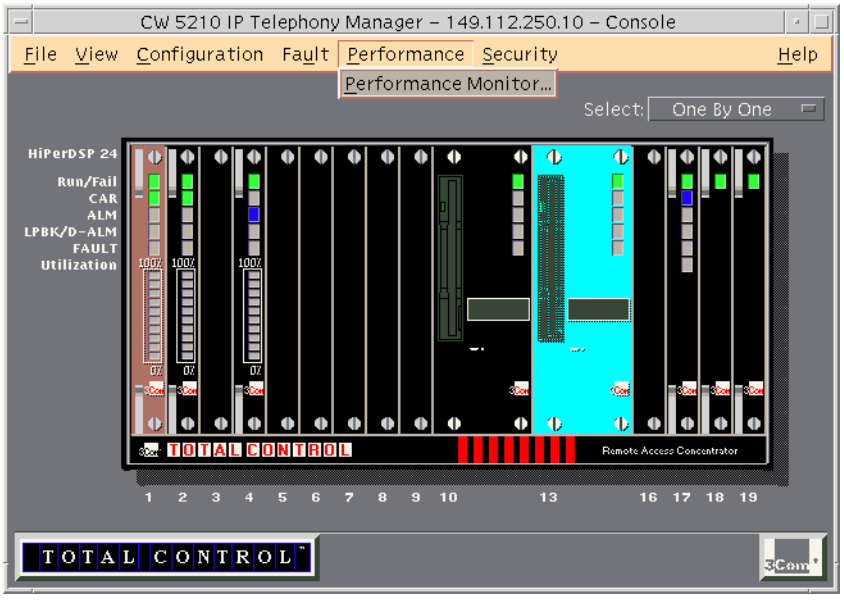
Figure 40 Trap Destination Window



Performance Menu

The Performance menu lets you define the events on your system that IP Telephony Manager is to monitor.

Figure 41 Performance Window



Performance Monitor Submenu

The Performance submenu lets you define the events that you want IP Telephony Manager to monitor and it then report on those events. You can also view historical information. Refer to the individual component user guide for information about setting this for your VoIP component.

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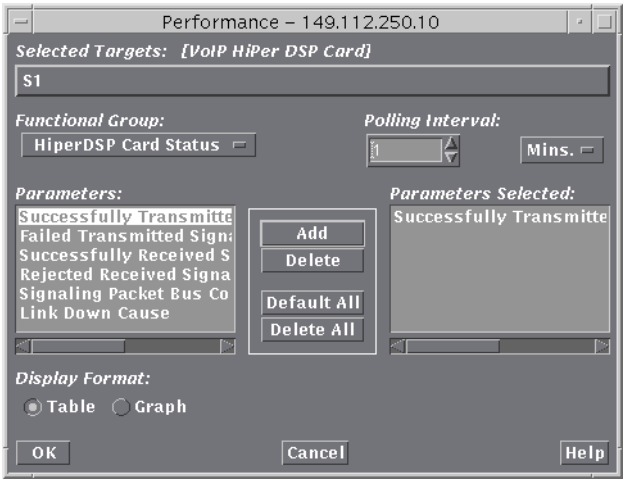
Figure 42 Performance Monitor Menu

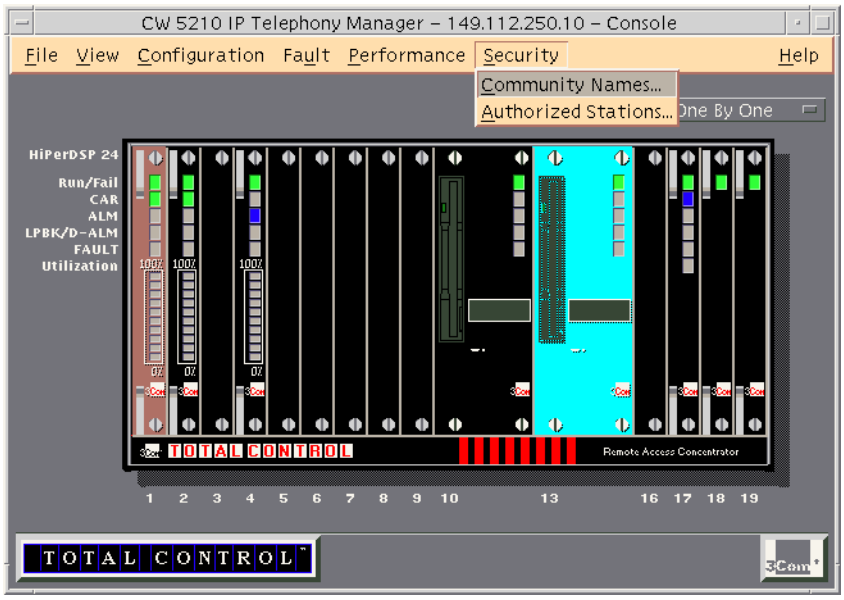


After you click OK, a table, or graph appears showing the events you selected in real time mode.

Security Menu

The Security menus lets you set the SNMP community strings and maintain the management capabilities at the selected station.

Figure 43 Security Menu



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Community Names Submenu

The Community Names submenu lets you set the SNMP community strings.

The IP Telephony Manager default value for SNMP community string is *public* for read only and *private* for read-write. To change the default values, you must first change the community string on the devices and then on IP Telephony Manager.

For security reasons, you cannot view the community strings through IP Telephony Manager.

For information about changing the community strings, refer to Changing the SNMP Community Strings, in Chapter 4.

Authorized Stations Submenu

The Authorized Stations submenu lets you maintain the management and security functions for the specified station.

The chassis Network Management Card (NMC) contains an authorized access list that lets you limit management capability to certain management stations on your network. After you create entries in the authorized access list, only those management stations can send SNMP requests to that device.

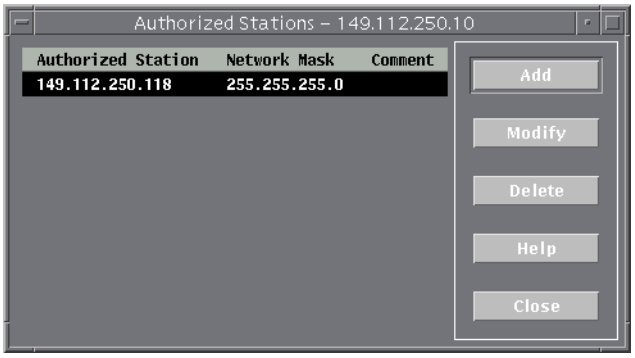
For information about setting the authorizations for a station, refer to Setting Authorized Stations, in Chapter 2.

To set up an authorized access list:

1. Open a console window for the device whose authorized access list you want to change.
2. From the **Security** menu, select **Authorized Stations**.

   The Authorized Stations window appears.

Figure 44 Authorized Stations Window



The Authorized Station window contains the following buttons:

- **Add**—Brings up a dialog box for entry of new authorized stations.

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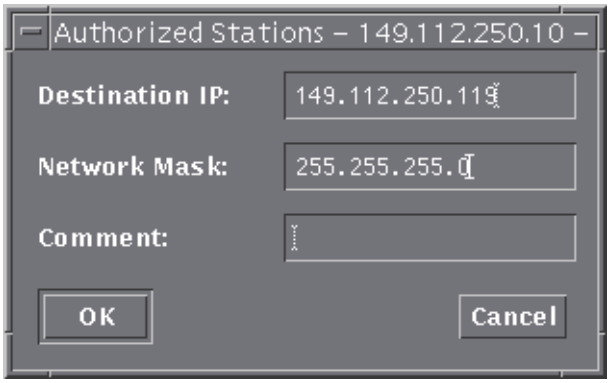
- **Modify**— Brings up a dialog box for changing the network mask or comment for the selected device. (You must select an entry from the list before using this button.)
- **Delete**—Deletes the selected entry.

When you click **Add**, the Authorized Stations Add dialog box appears.

Figure 45 Authorized Stations Add Window



The Authorized Stations Add window contains the following fields:

- **Destination IP**—Displays the IP address of the authorized station.
- **Network Mask**—Displays the network mask for the destination IP address that defines a range of IP addresses for authorized stations.
- **Comment**—Displays a user-entered description of the station.

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4 MAINTENANCE

This chapter describes how to use IP Telephony Manager to upgrade software and perform general maintenance tasks on CommWorks IP Telephony Platform cards.

This chapter contains the following topics:

- Upgrading Software
- Command Tool
- Restarting Other Entities
- Setting Manual Switchovers
- Changing the SNMP Community Strings
- Clearing Authorized Access Lists
- Displaying Inventory Information

Unless otherwise specified, this document uses the generic term edge server to refer to either the edge server card or the EdgeServer Pro card.

Upgrading Software

You can upgrade the Media Gateway, Gatekeeper, SIP Proxy, and Back-end Server software using SDL-2. IP Telephony Manager uses SDL-2 functionality to perform upgrades through SNMP and TFTP using a file structure of .dmf.

You can upgrade the software for the following entities using SDL-2:

Media Gateway:

- CommWorks SNMP SubAgent
- OOBMAN
- HiPer DSP
- Network Management Card (NMC)

Signalling Servers:

- CommWorks SNMP SubAgent
- Gatekeeper
- SIP Proxy
- OOBMAN

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Back-end Servers:

- CommWorks SNMP SubAgent
- OOBMan
- Provisioning Server
- Directory Mapping Server
- Accounting Server
- Billing Support Server

Remote upgrades of the above listed firmware cards are also accomplished through the use of SDL-2. SMS is no longer used for this purpose.

Software Upgrade Methods

You can transfer and install upgrade files by any of the following methods:

- **CommWorks IP Telephony Manager**—IP Telephony Manager is an SNMP-based management program for the CommWorks platform. IP Telephony Manager provides tools to transfer files to one or more components simultaneously over an IP network.
- **Direct Serial Connection**—You can connect a serial cable, with null modem adapter, between a computer and a serial port on a Total Control NIC, then transfer a file using any serial communications program that supports ZMODEM file transfers. Refer to the *Total Control 1000 Media Gateway Guide* for more information.
- **SNMP MIB Browser and TFTP Server**—If the other two options are not available, you can use an SNMP MIB browser and an TFTP Server to upgrade the firmware over an IP network.
- SDL2 Utility—The SDL2 utility runs on Windows NT. You can use it to upgrade the Media Gateway, SIP Proxy Server, Gatekeeper, and Back-end Servers as follows:

1. Connect a console, keyboard, and mouse to the server whose software you want to upgrade.
2. From the console window, open the command line interface.
3. Enter: **`Sdl2 [-hsv]`** `<DMF filename>`

   The command line options are:

   - **`-h`** Help
   - **`-v`** Verbose (Error Messages and installation status appear on the command line.)
   - **`-s`** Silent Mode (The setup process does not interact with the user. This is used on headless stations.)

   The SDL2 utility:

   - Creates a temporary directory.

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- Extracts the CAB file from the DMF file.
- Extracts the installation files from the CAB file.
- Runs the setup.

Table 9 lists a comparison of the installation methods.

Table 9 Upgrade Option Comparison

Option	Advantages	Disadvantages
IP Telephony Manager	■ Includes all necessary tools ■ Can perform remotely ■ Can upgrade more than one card at a time	■ Must install IP Telephony Manager first
Serial Connection	■ Minimal software requirement (ordinary serial communications program)	■ Requires a local connection between NIC and computer ■ Requires an unusual cable ■ Can upgrade only one card at a time
MIB Browser / TFTP Server	■ Can perform remotely	■ Requires specialized software ■ Unfriendly user interface

Upgrading the Software

After you have decided what method you want to install the upgrades, you are ready to upgrade your system with the current software.

If you need to reload the same version of the software on the Back-end Servers, you must uninstall the Back-end Server software first.

As an example, the procedures in this section refer to the CommWorks IP Telephony Media Gateway, specifically the HiPer DSP and HiPer NMC cards.

The software is released as two ZIP files, one for the HiPer DSP and one for the HiPer NMC.

1 Extract the DMF files using the UNIX **unzip** command.

The following table lists the contents of the zip file:

Table 10 Zip File Contents

Card	ZIP file	Contents of ZIP file	Contents of EXE file
HiPer DSP	hdm02xxxx.zip	hd02xxxx.dmf	n/a
		hr02xxxx.dmf	
HiPer NMC	nmcdisk3.zip	hipernmc.exe	hm0704xx.dmf
		nmcmibs.exe	several MIB files

2 Copy the DMF files to the **/opt/tcm/data/sdl** directory.

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If you do not have unzip capabilities on your UNIX system, you can download the freeware from the internet and install it on your system.

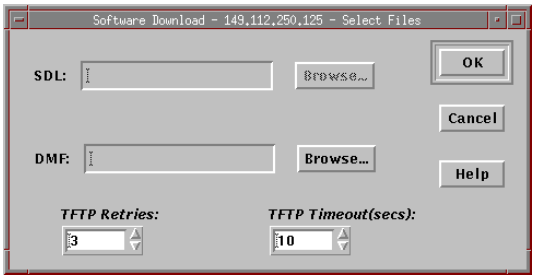
3 Select the component to which you want to download software. The Media Gateway, Gatekeeper, SIP Proxy Server or select the Back-end Server.

4 If you selected a server to download to, you are prompted to select an entity.

5 From the **Configuration** menu, click **Software Download**.

IP Telephony Manager associates the files with the correct component.

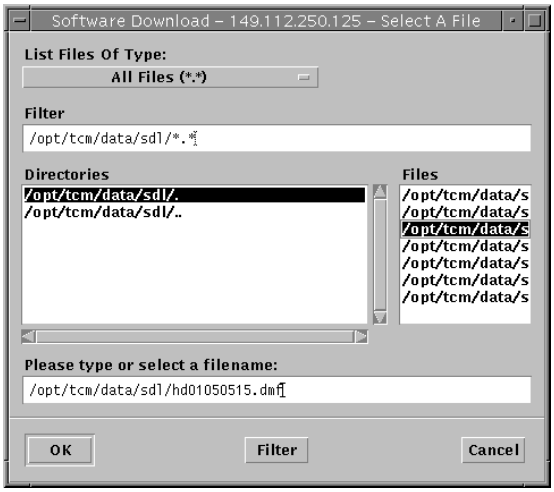
Figure 46 Software Download Dialog Box



6 Click **Browse**.

A new window appears showing all the software files.

Figure 47 Software Download (Select a File) Window



7 Click the software version you want to send to the selected component and click **OK**.

This closes the window and brings you back to the Software Download window.

8 Click **OK** to start the software download.

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When the software download is complete, a green box appears under the command status.

9 Click **OK** when finished.

Command Tool

The Command Tool is used to perform hardware and software commands on a selected component, such as busy-out, disconnect, reset, or save to NVRAM.

As an example, the procedures in this section refer to the CommWorks IP Telephony Media Gateway.

Launching the Command Tool

To launch the Command Tool, from the IP Telephony Manager Console window:

1 Select a card from the IP Telephony Manager Console window.

2 Select **Actions/Commands** from the **Configuration** menu on the IP Telephony Manager Console window.

3 Select the entity the command will be performed for.

You can also launch the Command Tool from:

- The network management platform network map (either OVW Network Node Manager or SNM): highlight the icon for a IP Telephony Manager Console device, then select **Actions/Commands** from the **Configuration** menu.
- The UNIX command line: use the **xtcmcmd** command, specifying the target device IP address or hostname and the target slots and channels. For complete syntax for the **tcmcmd** command, see Appendix B, Command Line Interface.

Card-Level vs. Channel-Level Commands

For the Media Gateway chassis, there are different command options depending on whether you select the whole card or individual channels within a card. See Appendix C for a list of commands for each type of card.

Command Window

After launching the Command Tool, the Command window appears.

Figure 48 shows the hardware commands that can be executed for the HiPer DSP card.

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Figure 48 Example HiPer DSP Hardware Commands

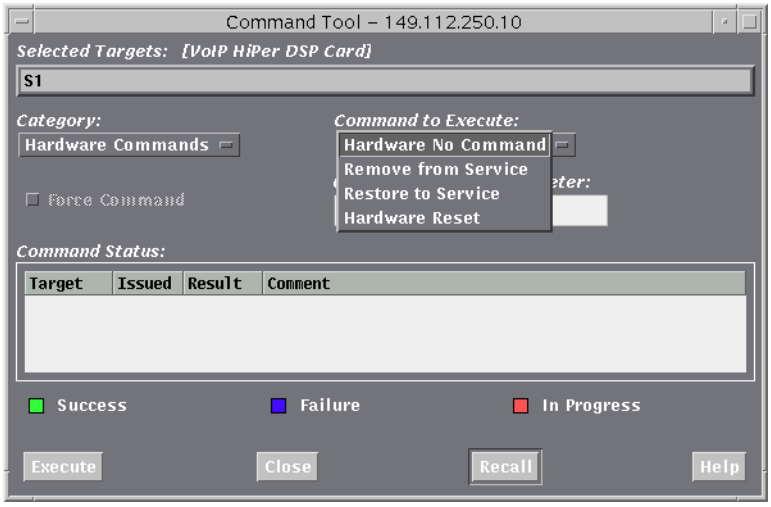
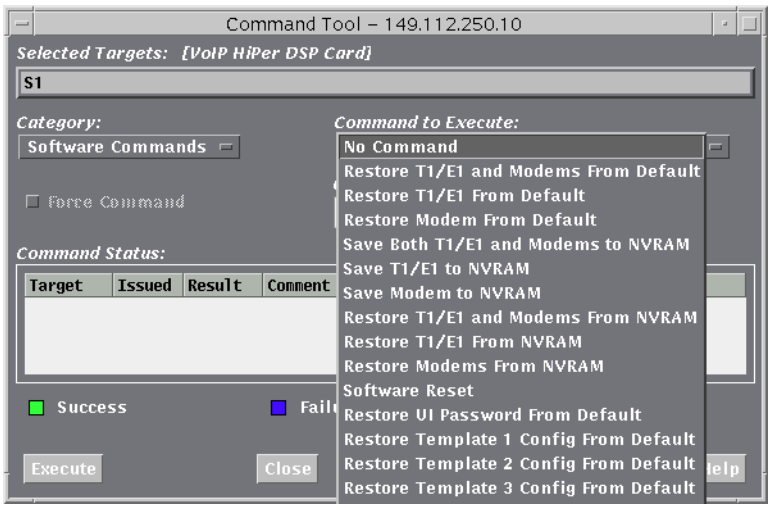


Figure 49 shows the software commands that can be executed for the HiPer DSP card.

Figure 49 Example HiPer DSP Software Commands



1 Select the type of command you want to perform from the Command to Execute or Category drop-down boxes.

2 Click **Execute** at the bottom of the window.

3 After executing the command, compare the results with the color-coded key below the status box.

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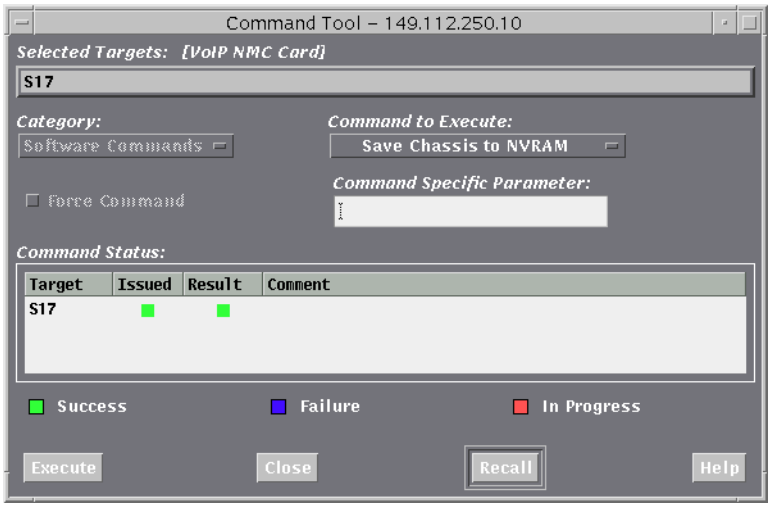
Figure 50 Example Media Gateway Command Status Color Codes



Restarting Other Entities

You can restart the Gatekeepers, Back-end Servers, and SIP Proxy Servers gracefully or by a hard restart. A graceful restart closes all open applications on the server, closes the operating system, and then restarts the computer, just as if you restarted the computer from the Windows **Start** menu. A hard restart closes the applications, processes, and operating system all at once, just as if you removed power from the computer. We **DO NOT** recommend executing a hard restart.

To restart the Gatekeeper, Back-end Servers, and SIP Proxy Server:

1. Using IP Telephony Manager, open the Media Gateway chassis.
2. Click **File**, and then click **Open**.
3. Select the entity you are configuring from the Device List.
4. Click **OK**.
5. Select the entity icon.
6. From the IP Telephony Manager Console window, select **Configuration**, then **Actions/Commands**.
7. When prompted to select an entity, click **Windows NT/OS** in the list box, and then click **OK**.
8. From the **Command to execute** menu, select **Graceful restart** (recommended) or **Hard restart**.
9. Click **Execute** and wait for a successful completion of the command.
10. Click **Close**.

IP Telephony Manager displays the entity as yellow until the operation completes. After the restart process is complete, the entity icon appears normal.

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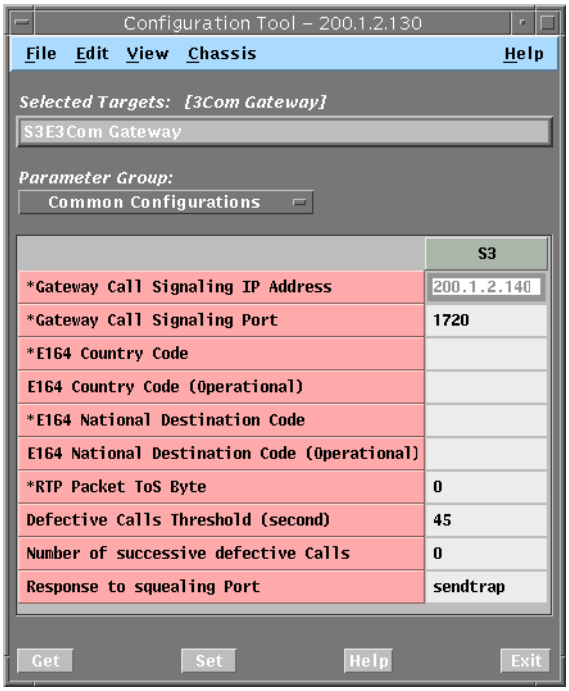
The entity has been successfully restarted.

Restarting after Parameter Changes

There are various parameters located under the Configuration menu that can be set to meet your requirements. The parameters that are prefixed with an asterisks (*) require that the entity be restarted when changes are made to the parameter.

The following figure displays some of the parameters with the asterisks (*).

Figure 51 Asterisks Parameter Example



If changes are made to any parameter with an asterisk, the entity selected will need to be restarted for the new values to be recognized.

If you need to restart the *Gateway*, you need to restart the edge server Plugin Manager Service (EPMS). To restart the EPMS, you can either restart the 3Com Gateway on IP Telephony Manager or stop and start the EPMS service from the service applet on the Windows NT machine. Refer to the *Total Control 1000 Media Gateway Guide* for more information.

If you need to restart the *Gatekeeper*, you can either restart 3Com Gatekeeper on IP Telephony Manager, or stop and start 3Com VoIP Gatekeeper service applet on Windows NT machine. Refer to the *CommWorks 4200 Gatekeeper Guide* for more information.

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For the Back-end Servers:

- *Accounting Server*—restart 3Com Accounting service on IP Telephony Manager, or stop and start 3Com VoIP Accounting Data service applet on the Windows NT machine.
- *Directory Mapping Server*—restart 3Com Directory service on IP Telephony Manager, or stop and start 3Com VoIP Directory Data service applet on the Windows NT machine.
- *Provisioning Server*—restart MS web server on IP Telephony Manager, or stop and start World Wide Web Publishing service applet on the Windows NT machine.

Setting Manual Switchovers

You can force the Gatekeeper to manually switch-over to another Accounting, Directory Mapping, or Authentication Server.

To set the manual switchover:

1. Using IP Telephony Manager, open the Media Gateway chassis.
2. Click **File**, and then click **Open**.
3. Select the Gatekeeper you are configuring from the Device List. If the Gatekeeper is not listed, see Connecting to Entities in Chapter 1.
4. Click **OK**.
5. Select the server graphic.
6. Click **Actions/Commands** from the **Configuration** menu.
7. When prompted to select an entity, click **3Com Gatekeeper** in the list box, and then click **OK**.

   The **Command Tool** dialog box appears.
8. Click **Switchover Commands** in the **Category** drop-down list.
9. From the **Command to Execute** drop-down list select **Switch Accounting**, **Switch Directory**, or **Switch Authentication**.
10. Enter the IP address of the new server in the **Command Specific Parameter** field.
11. Click **Execute** and wait for a successful completion of the command.

    The server switch-over has been set.
12. Repeat steps 10 through 12 for each server type to manually switchover.
13. Click **Close**.

A real time table appears and displays the selected Media Gateway and the Gatekeeper to which it is registered. The IP address is of the Gatekeeper to which it is registered is also displayed.

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Changing the SNMP Community Strings

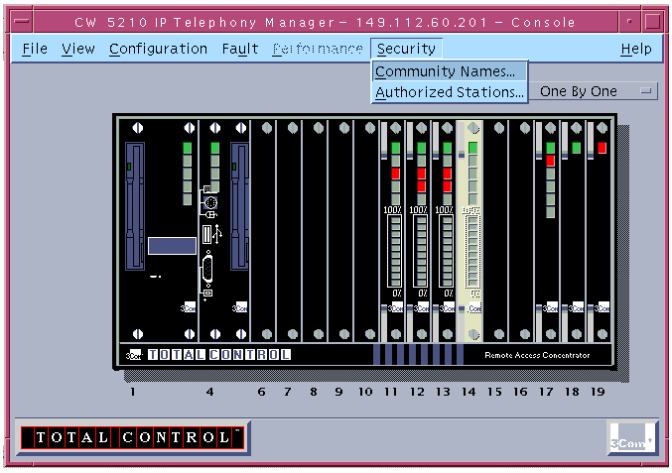
The IP Telephony Manager default value for SNMP community string is *public* for read only and *private* for read-write. To change the default values you must first change the community string on the devices and then on IP Telephony Manager.

For security reasons, you cannot view the community strings through IP Telephony Manager.

To change the SNMP community strings on the devices, from the IP Telephony Manager main window:

1 Select **Community Name** from the **Security** menu.

Figure 52 Community Name Drop-Down


CW 5210 IP Telephony Manager – 149.112.60.201 – Console
File View Configuration Fault Performance Security Help
Community Names...
Authorized Stations...
One By One
TOTAL CONTROL
Remote Access Concentrator
1 4 6 7 8 9 10 11 12 13 14 15 16 17 18 19
TOTAL CONTROL

The Community Name dialog window appears.

Figure 53 Community Name Dialog Window

2 Enter the community string in the Community Name field.

3 Click **Set**.

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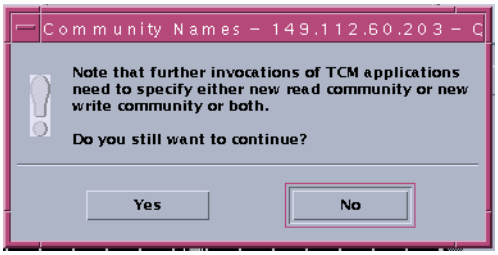
A warning message appears verifying that you are about to change the community string and that this change will impact any user who tries to connect to the IP Telephony Manager chassis.

Figure 54 Community String Warning Message


Community Names - 149.112.60.203 - C
Note that further invocations of TCM applications need to specify either new read community or new write community or both.
Do you still want to continue?
Yes
No

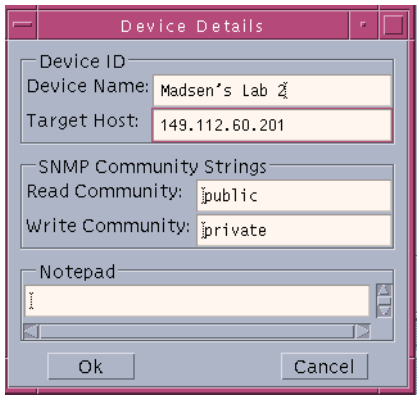
After you make this change, the current active IP Telephony Manager session, will not be able to modify, or read (depending on how you have reset the community strings) the current opened chassis until you specify the same community strings for IP Telephony Manager.

You have changed the SNMP community strings on the devices. The next steps changes the community string for the IP Telephony Manager. There are two methods available, either through IP Telephony Manager or through the Command Line interface.

To change the IP Telephony Manager community string through IP Telephony Manager:

1. Select **File** and then **Open** on the IP Telephony Manager Console window.
2. Select the targeted device from the list.
3. Click **Details.**
4. The Device Details dialog box appears.

Figure 55 Device Details Dialog Box



5. Enter the new SNMP community string.

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6 Click **OK**.

7 If you changed the 3Com SNMP Community Strings on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities for more information.

To change the IP Telephony Manager community string through the command line enter:

xtcmvfpd <*target chassis IP address*> [-c readcomm][-C writecomm]

where:

- readcomm—read only community string
- writecomm—read/write community string

If you changed the 3Com SNMP Community Strings on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities for more information.

For more information about this command, refer to Appendix B, Command Line Interface.

Clearing Authorized Access Lists

If your management station is listed in the authorized access list:

1 Open a console window for the device whose authorized access list you want to clear.

2 From that console window, click **Security,** then **Authorized Stations**.

3 Click the IP address to be cleared from the authorized access list, and then click **Delete**. Repeat this step for each entry until you have deleted all entries.

4 If you changed the authorized access list on the Gatekeeper, SIP Proxy Server, or any of the Back-end Servers, you must restart the SNMP agent. Refer to Restarting Other Entities for more information.

If your management station is NOT an authorized station and you need to clear the access list to gain management capability for a device, you must use the User Interface on the back of the NMC. Refer to the operator's guide or installation manual for that device for instructions on how to use the User Interface.

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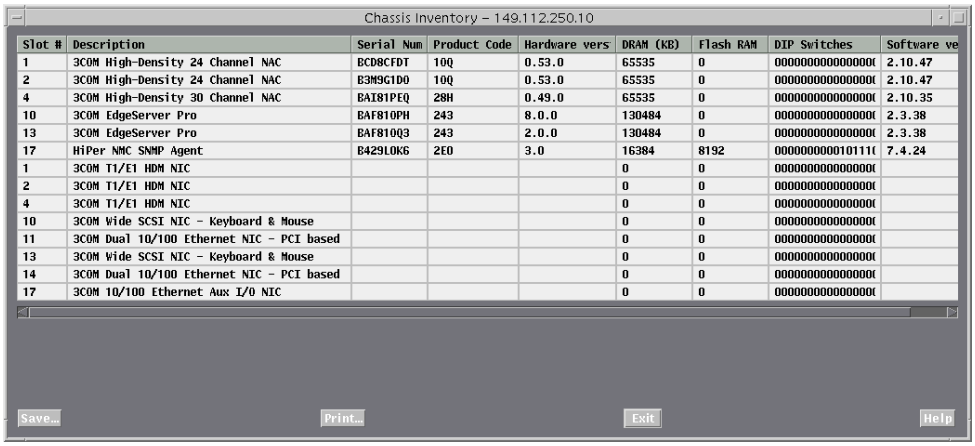
Displaying Inventory Information

The IP Telephony Manager can display the installed components on your VoIP system; such as the serial numbers, hardware and software version, DIP switch settings, and memory for each card.

To display inventory information from the IP Telephony Manager Console window, click **Configuration** menu, and then select **Inventory**.

The **Inventory** window appears with the information.

Figure 56 Inventory Window



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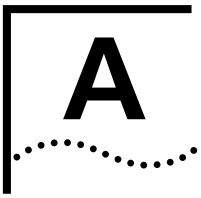

Error Messages

Overview

Error messages are divided into two types:

- Invocation Errors—result from missing or invalid use of command syntax, and are reported immediately to stderr. They include:
  - Command Line Target Selection
  - Chassis Restore
  - Chassis Save
  - Command Tool
  - Configuration Tool
  - Software Download
  - Test Tool
  - IP Telephony Manager Console
  - Tone Send/Receive
  - Trap Destination
- Execution Errors—result from problems occurring after an application is successfully launched. They include:
  - All Applications
  - Chassis Restore
  - Chassis Save
  - Command Tool
  - Configuration Tool
  - Test Tool
  - IP Telephony Manager Console
  - Tone send/receive
  - Trap Destination
  - Software Download

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Invocation Errors

This topic describes the error messages that can occur from a command syntax error.

The invocation errors categories listed here are:

- Command Line Target Selection
- Chassis Restore
- Chassis Save
- Command Tool
- Configuration Tool
- Software Download
- Test Tool
- IP Telephony Manager Console
- Tone Send/Receive
- Trap Destination

Command Line Target Selection

The following are the Command Line Target Selection error messages and a description of what they indicate.

Range out of order <*target specification***>**
A range is backwards (e.g., S5-3 instead of S3-5).

Slot selection is not allowed <*target specification***>**
The application cannot be invoked at the slot level.

Channel selection is not allowed <*target specification***>**
The application cannot be invoked at channel level (e.g., software download).

Time slot selection is not allowed <*target specification***>**
The application cannot be invoked at time slot level. (True for all except commands.)

Slot number out of range <*target specification***>**
A slot number refers to a slot out of range for the given type of chassis. (e.g., slot 10 in a 7-slot chassis.

Channel number out of range <*target specification***>**
A large channel number (not valid for any IP Telephony Manager card) was specified.

Channel number out of range at slot <*target specification***>**
A channel number refers to a channel not present on the given type of card in the selected slot.

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Channel range contains zero: <*target specification***>**
A channel range includes 0 (e.g., S1C0-2).

Time slot range contains zero: <*target specification***>**
A time slot range contains zero.

Expected slot-level target: <*target specification***>**
The target specification began with a slot-level target but also has targets at some other level.

Expected time slot-level target: <*target specification***>**
The target specification began with a time slot-level target but also has targets at some other level.

Slot <number> empty: <*target specification***>**
There is no card in the specified slot, based on information available at the last discovery or IP Telephony Manager Console poll.

Unknown card in slot <*number***>**
The card in the specified slot is unknown and the application does not allow operation against unknown cards.

Mismatched targets: slot <*number***>, slot <***number***>**
The two slots contain cards that are not compatible for the present application's purposes.

Time slot selection not applicable: <*target specification***>**
There is no time slot-level support for the particular card for which a time slot specification was given (e.g., the card is not a T1 or ISDN card).

Chassis Restore

The following are the Chassis Restore error messages and what they indicate.

No target specified
The user did not supply an IP address or host name on the command line.

Too many targets specified
The user specified more than one IP address/host name (there is more than one white space-separated word in the target list).

Chassis Save

The following are the Chassis Save error messages and what they indicate.

Unknown target name or IP address format
The target does not specify a valid IP address or host name.

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Error, unexpected command line format

The user did not supply an IP address, or (Non-GUI only) did not provide a filename.

Command Tool

The following are the Command Tool error messages and what they indicate.

Missing -E option

The user did not choose a command to execute using the -E option. (Non-GUI only)

Missing -G option

The user did not choose a command group using the -G option. (Non-GUI only)

Non-graphical time slot selection is not supported: <*specification*>

The user requested time slot selection in the non-GUI by supplying an empty time slot range (e.g., S1C1T). (Non-GUI only)

Warning: force not supported for this command

The user provided the -F option for a command that does not allow forcing. The -F option will be ignored. (Non-GUI, warning only)

Error: invalid poll interval value <*value*> for -p option

The poll interval value given on the command line is not a positive integer.

Error: cannot use -E and -q at the same time

The user specified both a command and a command query. This is not allowed.

Error: No target specified

The user did not supply at least an IP address or host name on the command line.

Error: Too many targets specified

The user specified more than one IP address/slot-channel combination. (There is more than one whitespace-separated word in the target list.)

Invalid target format

The target does not specify a valid IP address or host name.

Configuration Tool

The following are the Configuration Tool error messages and what they indicate.

Error: No target specified

The user did not supply at least an IP address or host name on the command line.

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Error: Too many targets specified

The user specified more than one IP address/slot-channel combination. (There is more than one white space-separated word in the target list.)

Invalid target name

The target does not specify a valid IP address or host name.

Software Download

The following are the Software Download error messages and what they indicate.

Error: No target specified

The user did not supply at least an IP address or host name on the command line.

Error: Invalid target format

The target does not specify a valid IP address or host name.

Selected Targets do not match each other

Fatal error. Multiple NACs were selected for software download, but one or more of the selected NACs is not the same card type. Only the first mismatch is displayed.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking on the OK button of the dialog box terminates the utility.

All selected slots are empty

Fatal error. Selected slots do not contain a card.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking on the OK button of the dialog box terminates the utility.

extension is not 'NAC'

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the specified SDL file does not have the correct extension (*.nac).

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select the correct file.

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Extension is not 'sdl

'Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the specified SDL file does not have the correct extension (*.sdl).

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select a NAC file.

No default NAC file

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the SDL file was selected, but the NAC file was not.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select a NAC file.

No default SDL file

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the NAC file was selected, but the SDL file was not.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select the correct file

<*filename***> does not match card type <***type***>**

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the SDL file and the NAC file apply to different card types.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select the correct file.

Test Tool

The following are the Test Tool error messages and what they indicate.

Error: invalid Loop Back Duration value <value**> for -s option**

The loopback duration given on the command line is not a positive integer.

Error: cannot use -T and -q at the same time

The user specified both a test and a test query. This is not allowed.

Error: No target specified

The user did not supply at least an IP address or host name on the command line.

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Error: Too many targets specified

The user specified more than one IP address/slot-channel combination. (There is more than one white space-separated word in the target list.)

Invalid target format

The target does not specify a valid IP address or host name.

Missing -T option

The user did not choose a test to execute using the -T option. (Non-GUI only)

<target**>: Non-Modem Test operation**

Reported in the test tool final summary when a command or other non-modem test result is in the target's result table. (Non-GUI, warning only)

Program exit during execution

The command or test program was terminated (e.g., by a signal) while a command or test was in progress. (Warning only)

IP Telephony Manager Console

The following are the IP Telephony Manager Console error message and what it indicates.

Error: Too many targets specified

The user specified more than one IP address/host name. (There is more than one white space-separated word in the target list.)

Tone Send/Receive

The following are the Tone Send/Receive error messages and what they indicate.

Error: Invalid amplitude value <*value***>**

The amplitude level given on the command line is out of range.

Error: invalid poll interval value <*value***>**

The poll interval value given on the command line is not a positive integer.

Error: invalid test length value <*value***>**

The test duration value given on the command line is not a positive integer

Error: No target specified

The user did not supply an IP address or host name on the command line.

Invalid target specification: <*specification***>**

The target does not specify a valid IP address or host name.

Trap Destination

The following are the Trap Destination error messages and what they indicate.

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Error: insufficient arguments

A "-a", "-m", or "-d" directive ended unexpectedly.

Error: no target supplied

The user did not supply an IP address or host name on the command line.

Error: invalid target format

The target is not a valid IP address or host name, or contains slot/channel specifications.

Warning: at most 256 trap commands accepted.

The user specified more than 256 "-a", "-m", or "-d" directives. The remaining directives will be ignored.

Unexpected argument: <*argument*>

A directive other than "-a", "-m", or "-d" was seen on the command line.

Warning: trap directives on GUI command line are ignored.

The user provided "-a", "-m", or "-d" directives to the GUI (xtcmtrap).

Execution Errors

This section describes all error messages that can occur as after an application is successfully launched.

The execution errors categories listed here are:

- All Applications
- Chassis Restore
- Chassis Save
- Command Tool
- Configuration Tool
- Test Tool
- IP Telephony Manager Console
- Tone send/receive
- Trap Destination
- Software Download

All Applications

The following are the Execution error messages for all applications and what they indicate.

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Error constructing target specification...hostname no longer valid?

The user was prompted for target slot/channels using the chassis selection dialog. After targets were selected, the construction of a target failed, probably because an IP host name could not be found in the hosts database even though the host name was valid at program initialization. (The host database has probably been changed or is no longer accessible.)

Target not responding because NMC is in a software download state. Please wait until software download is completed.

The NMC is being actively downloaded, or a download was initiated and not finished. It will not respond to SNMP requests until download is completed.

NMC in software download state!

The NMC is being actively downloaded, or a download was initiated and not finished. It will not respond to SNMP requests until download is completed.

SNMP Get: <*error***>**

An error occurred while IP Telephony Manager was issuing an SNMP operation: either a timeout or an SNMP protocol error. If it is a protocol error, the SNMP variable information in the error response can be seen in the IP Telephony Manager log (e.g., syslog).

SNMP Get-Next: <*error***>**

An error occurred while IP Telephony Manager was issuing an SNMP operation: either a timeout or an SNMP protocol error. If it is a protocol error, the SNMP variable information in the error response can be seen in the IP Telephony Manager log (e.g., syslog).

SNMP Set: <*error***>**

An error occurred while IP Telephony Manager was issuing an SNMP operation: either a timeout or an SNMP protocol error. If it is a protocol error, the SNMP variable information in the error response can be seen in the IP Telephony Manager log (e.g., syslog).

Cannot find device files for NMC version <*version***>!**

IP Telephony Manager is communicating with an NMC version too recent for it. Contact CommWorks sales personnel for a newer version of IP Telephony Manager.

This device is not a IP Telephony Chassis. Exiting.

IP Telephony Manager was launched against an SNMP device that was not an Enterprise Network Hub or Modem Pool.

Missing or invalid card.dat file!

IP Telephony Manager has a corrupt device configuration schema, or other internal error.

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Missing or invalid device.dat file!

IP Telephony Manager has a corrupt device configuration schema, or other internal error.

Missing or invalid software.dat file!

IP Telephony Manager has a corrupt device configuration schema, or other internal error.

IP Telephony Manager Discovery error: <*specific error***>**

An error occurred in attempting to launch IP Telephony Manager against a chassis (e.g., the discovery process timed out or had some other error).

Invalid host name: <*name***>**

IP Telephony Manager was launched against a host name not in the hosts database.

Target Selection Error

The user was prompted for target slot/channels using the chassis selection dialog. After targets were selected, an internal error occurred.

Chassis Restore

The following are the Chassis Restore error messages and what they indicate.

Configuration parse error: <*specific error***>**

The chassis configuration file being restored is invalid and the restore will not occur. (Nonfatal configuration parse warnings are also produced.)

File is not a Chassis Configuration File

The user specified a file that does not begin with the CommWorks chassis configuration file header.

Can't access <*filename***>**

The user specified a file that does not exist or is not readable.

<*filename***> is a directory.**

The user specified a file that is a directory. Only plain text files may be restored.

There is no matching configuration to restore

The chassis configuration file being restored contains no parameters to be restored, or those sections which actually match working target slots (if any) contain no parameters.

Restore was unsuccessful

At least one of the slots being restored experienced an SNMP error or other serious failure. ("Bad cards" that are skipped by the restore are not counted in this evaluation.)

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The selected configuration file was saved from a chassis of a different size. Continue?
Select either Yes or No.

.whb file does not match chassis size
Fatal error unless -F (force mismatch) is specified.

The selected configuration file is from a chassis with a different card configuration. Continue?
Select either Yes or No.

Chassis Save

The following are the Chassis Save error messages and what they indicate.

<*file*> already used by another process
Another program is currently saving to the specified file.

error opening <*file*>
<*file*> is on a remote machine.

link to that machine is no longer active
A remote mount of the file is not working.

unable to lock <*file*>
The lock mechanism that prevents two users from writing the same file is in deadlock (due to a system error or unusual race condition).

There is no matching configuration to save
No working, known cards in the chassis contain any configurable parameters to be saved.

Command Tool

The following are the Command Tool error messages and what they indicate.

An unrecoverable error has occurred.
An SNMP error or other problem prevented the cycle of commands from being issued to all target devices. The user may retry the command if desired (GUI); fatal in non-GUI. Detailed error information may be available in the IP Telephony Manager log.

Unrecoverable error
An SNMP error or other problem prevented the cycle of commands from being issued to all target devices. The user may retry the command if desired (GUI); fatal in non-GUI. Detailed error information may be available in the IP Telephony Manager log.

Error in time slot specification
The user was prompted for target time slots; after selection, an internal error occurred. (GUI only)

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There are no commands for this type of device.
The device configuration files do not list any commands for the target device.

Invalid group name: <*name*>
The device configuration files do not list <*name*> as a valid group.

Invalid command: <*name*>
The device configuration files do not list <*name*> as a valid command within the current group.

Slot <*number*> T1/PRI query: <*specific error*>
An error occurred in trying to verify or solicit a time slot range specified against a T1 or ISDN card.

Invalid time slot range for card: <*specification*>
The user specified a time slot range which includes time slot numbers not valid for the given type of card.

Command Specific Parameter exceeds maximum length of <*length*>
The user entered a command parameter that was too long (GUI only). The command will not be executed.

Slot <*number*>: graphical selection of time slots in this card is not supported.
IP Telephony Manager is not able to present a selection dialog for the given card. (The card type is not supported by this particular version of IP Telephony Manager.)

<*target*>: Non-command operation
Reported in the command tool final summary when a modem test or other non-command result is in the target's result table. (Non-GUI, warning only.)

Cancel Execution and exit program?
Issued in a "Yes/No" dialog when user quits from window frame while command/test is in progress. (GUI, warning only)

Program exit during execution
The command or test program was terminated (e.g., by a signal) while a command or test was in progress. (Non-GUI, warning only)

Configuration Tool

The following are the Configuration Tool error messages and what they indicate.

This device is not the same type as target(s).
The "load from" source does not match the target devices whose new values are to be loaded.

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Cannot load between channel and card levels

The "load from" source is at channel level while the target devices are at card level, or vice versa.

Missing device configuration file

There is no configuration schema file for the target devices.

There are no configurable parameters for this type of card

The target slot or channel has no configurable parameters.

Modification(s) in current group will be overwritten. Proceed with update?

Issued in a "Yes/No" dialog when the user selects "get" in a group that has un-set modifications. (Warning only)

Modification(s) in all groups will be overwritten. Proceed with loading?

Issued in a "Yes/No" dialog when the user selects "load from" and there are groups that have un-set modifications. (Warning only)

Test Tool

The following are the Test Tool error messages and what they indicate.

No defined tests to execute

The device configuration files do not list any tests for the target device.

Invalid Test: <*string*>

The specified test is not in the list of valid tests.

Selected device is not a modem

Test Tool may be invoked only against modems.

No "Software Commands" found

The Test Tool could not locate the list of tests within the "Software Commands" group of the device configuration file. This indicates a probable internal error or corrupt device configuration schema.

An unrecoverable error has occurred.

An SNMP error or other problem prevented the cycle of tests from being issued to all target devices. The user may retry the test if desired. Detailed error information may be available in the IP Telephony Manager log.

Unrecoverable error

An SNMP error or other problem prevented the cycle of tests from being issued to all target devices. The user may retry the test if desired. Detailed error information may be available in the IP Telephony Manager log.

<*target*>: Non-Modem Test operation

Reported in the test tool final summary when a command or other non-modem test result is in the target's result table. (Non-GUI, warning only)

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Cancel Execution and exit program?

Issued in a "Yes/No" dialog when user quits from window frame while command/test is in progress. (GUI, warning only)

Program exit during execution

The command or test program was terminated (e.g., by a signal) while a command or test was in progress. (Non-GUI, warning only)

IP Telephony Manager Console

The following are the IP Telephony Manager Console error messages and what they indicate.

There are other IP Telephony Manager console(s) viewing this chassis from your system. (This is not a problem as long as you are coordinating your usage with other users.)

A IP Telephony Manager Console has already been opened on the current system against the given chassis. That console is performing chassis polling and providing chassis internal status to all IP Telephony Manager applications at the time they are launched. The IP Telephony Manager Console reporting this message will poll chassis status independently of the first console, but will not provide chassis status information to other IP Telephony Manager applications. (Warning only)

Could not acquire ownership of chassis status file. Launched processes will perform their own discovery.

This usually means that the user launching the IP Telephony Manager Console does not have write ownership of the chassis status information file for this chassis. This can occur if a user such as root opens a IP Telephony Manager Console and exits it, and other users then launch IP Telephony Manager Console. (The file can be manually removed in this case; it resides in /tmp/vfpd.<*ip-hex*> where <*ip-hex* is the hexadecimal representation of the IP address.) (Warning only)

Internal error acquiring chassis status file. Launched processes may perform their own discovery.

An unknown error occurred in trying to update the chassis status information file for this chassis. (The IP Telephony Manager log may provide more information.) (Warning only)

<*command***>: exec failed: <***reason***>**

IP Telephony Manager Console experienced an error when trying to launch a IP Telephony Manager application. This is printed on the controlling terminal of the IP Telephony Manager console (the terminal from which IP Telephony Manager console or its parent was launched).

Tone send/receive

The following are the Tone send/receive error messages and what they indicate.

Invalid slot number: <*number***>**

The target slot is not a NAC slot number.

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Selected device is not a modem
The target slot is not a modem.

Channel number out of range: <*number*>
The target channel number is invalid for the particular type of card.

No DS0 assigned to modem. Test aborted.
The modem does not have a time slot assignment and tone test is therefore impossible.

Extra targets, only the first will be used
The user selected more than one modem when invoking a tone test. The first specified modem will be used, and the others ignored. (Warning only)

Extra command argument after target: <*string*>
Unused information was seen at the end of the command line and will be ignored. (Warning only)

Receive ignores frequency/amplitude command arguments
Receive Tone was invoked with frequency/amplitude arguments, which will be ignored. (Warning only)

Test in progress. Stop it before exiting?
Issued in a "Yes/No" dialog when user quits from window frame while a tone test is in progress. (GUI, warning only)

Trap Destination The following are the Trap Destination error messages and what they indicate.

Invalid IP address: <*ip-addr*>
The IP address entered is not a valid dot-notation IP address or host name in the host database.

You must enter an IP Address!
When adding a trap destination, the user entered a blank IP address/host name. (GUI only)

String 'invalid' may not be used
The community string 'invalid' is a reserved value and is not allowed to be entered as data. (GUI only)

Community string too long. Truncate?
Issued in an "OK/Cancel" dialog when a community string and/or comment is entered that is too long. (GUI, warning only)

Comment too long. Truncate?
Issued in an "OK/Cancel" dialog when a community string and/or comment is entered that is too long. (GUI, warning only)

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Community string and Comment too long. Truncate?

Issued in an "OK/Cancel" dialog when a community string and/or comment is entered that is too long. (GUI, warning only)

Trap query overrides -a/-m/-d

The user specified both -q (query) and -a/-m/-d (table manipulation) arguments; only -q will be used. (Non-GUI, warning only)

Nothing to do

No trap destination-modifying arguments were given on the command line. (Non-GUI, warning only)

Community string longer than <*number*> chars: <*string*>

The specified string exceeded the size limit for community strings. (Non-GUI, warning only)

Comment longer than <*number*> chars: <*string*>

The specified string exceeded the size limit for community strings. (Non-GUI, warning only)

String 'invalid' may not be used

The community string 'invalid' is a reserved value and is not allowed to be entered as data. (Non-GUI, warning only)

Software Download

The following are the Software Download error messages and what they indicate.

IP Telephony Manager Discovery Error: Device not responding

Fatal error. The Software Download utility was unable to discover some or all of the cards in the chassis.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking **OK** of the dialog box terminates the utility.

Target is not responding because its NMC is in the software download state\loading NAC file\. Please load target when NMC download is completed.

Fatal error. The Software Download utility was unable to discover the chassis objects because the NMC was in a Software Download state-either erasing Flash ROM or loading the NAC file.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking **OK** of the dialog box terminates the utility.

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<*filename*> does not exist

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if you selected a filename that does not exist.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select the correct file.

No Default SDL File for Card Type <*type*>

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if there are no SDL/NAC files for the selected card type in the default /$TCMHOME/data/sdl directory.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select the correct file.

<*filename*> is corrupt

<*filename*> has a corrupt header marker

<*filename*> has wrong software type

<*filename*> has a crc error

Fatal Error (tcmsdl). Nonfatal error (xtcmsdl). This error occurs if the internal header or the SDL or NAC file is incorrect.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility terminates. For xtcmsdl, click **OK** to bring up the Select Files dialog box and select an uncorrupted SDL or NAC file. If one is not available, you will have to acquire an uncorrupted version from the CommWorks BBS or Internet FTP site.

Devices are not ready yet. This could be due to a previously aborted SDL followed by a premature new SDL. Please try waiting a few minutes or invoking a hardware reset on the affected cards.

Fatal error. This error occurs if the target card is communicating with the Software Download utility, but is unable to accept a software download.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking **OK** of the dialog box terminates the utility.

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SNMP Set Failed

Fatal error. This error occurs if the target card is communicating with the Software Download utility, but does not respond correctly to a SNMP Set command. The exact SNMP error is displayed.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking the **OK** button of the dialog box terminates the utility.

SNMP Get Failed

Fatal error. This error occurs if the target card did not respond to an SNMP Get request. The exact error is also displayed.

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking the **OK** button of the dialog box terminates the utility.

Erase ROM time out

Fatal error. This error occurs if the target card's Flash ROM is not erased within the specified timeout (600 seconds).

For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking the **OK** button of the dialog box terminates the utility.

TFTP: <*error***>**

Fatal Error: This is a series of errors that can occur when the Software Download utility is overwriting the target card's configuration with the new code. Such errors include:

- file not found
- file already exists
- no such user
- time out
- disk full or allocation exceeded
- access violation; this could indicate a corrupt or incorrectly named file. This error occurs if a NAC is pulled out of its slot while the download is taking place.
- illegal TFTP transfer ID; this occurs if there is an internal NMC or chassis error during downloading.
- undefined error code
- For tcmsdl, an error message is displayed on the screen or output to the log file, and then the utility automatically terminates. For xtcmsdl, clicking the **OK** button of the dialog box terminates the utility.

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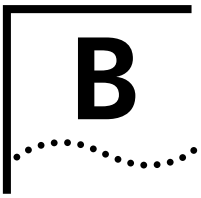

COMMAND LINE INTERFACE

The command line interface consists of a number of non-interactive commands or utilities. These utilities are run at the command line from a shell prompt or a shell script.

This appendix contains the following catatorgies of commands:

- General Syntax
- IP Telephony Manager Console
- Configuration
- Actions/Commands
- Set Trap Destination
- Monitoring SNMP Parameters
- Tone Test
- Modem Tests
- Device Save and Restore
- Software Download
- Feature Enable
- Inventory
- Authorized Station Tool
- AutoResponse

General Syntax

The following command parameters are available for all utilities:

[x]*command* **[-l** *logfile***] [-h] [-c readcomm] [-C writecomm] target**

Brackets indicate that the parameter is optional. Italics indicates the value to be supplied by you.

Where:

[x]command

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An "x" placed at the beginning of any IP Telephony Manager command omits command parameters and the target slot and channel designation-only the target IP address or hostname is required. Graphic user interfaces (GUIs), such as the IP Telephony Manager device display, appear and assist you in selecting component parameters and targets.

When using the "x" prefix, for any IP Telephony Manager command, only the target IP address or hostname is required. All other parameters are optional.

For example, if you want to make a modem go off hook, you could simply send the following command:

xtcmcmd 192.78.203.68

First, the device display appears, allowing you to select targets for the command. After you select your targets, the Command window appears, allowing you to select and execute the Off Hook command.

[-l *logfile*]

The filename for the log

If omitted from the command line, messages are sent to the screen by default (handled as stderr).

If using the x prefix, messages are sent to syslog

To send messages to syslog by default, specify "-" (hyphen) in place of logfile ("-l-" can be sent by itself, it doesn't have to be included in the command line).

The "-l-" command also changes the GUI default log output to stderr.

(-h)

This switch can be used by itself to display the syntax for a given utility.

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For instance, to display Help for the Software Download utility, type the following command:

```
tcmsdl -h
```

```
[-c readcomm][-C writecomm]
```

readcomm—read only community string

writecomm—read/write community string

Used to specify the SNMP community strings that have been assigned to the device. Note that these switches are optional, but can be used to override IP Telephony Manager's initialization file settings.

Target

For all utilities, you must specify the IP address or hostname for the device on which the operation is to be performed. Some utilities require a more specific target designation that includes slot and channel. T1 cards also allow timeslot designations for some utilities.

The x command prefix requires only the IP address or hostname, even if the command calls for specific slots and channels.

The following format is for an unlimited number of targets within the same device:

```
IPhost:[ [Srange [Crange[Trange] ] ],
[ [Srange [Crange[Trange] ] ], . . .
```

where:

Iphost

The IP address or hostname of the target device.

Range

A single integer or a range of integers (for example, 1-4).

: (colon)

Place after the IPhost designation.

, (comma)

Place between slot groups.

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S

Sets target slots in the specified range

C

Sets target channels in the specified range. If omitted, execution at the card level is assumed.

T

Sets target timeslots in the specified range. If omitted, execution at the channel (span line) level is assumed. When used with the Command Tool, this part of the target can be given as T (without a range) and you will be prompted for a timeslot (for xtcmcmd only).

Only one type of component can be selected at a time. For example you can select all HiPer DSP channels, but you CANNOT select a HiPer DSP channel and a T1 DS0.

Target Examples:

193.77.205.45

193.77.205.45:S3C4,S4C1,S5C2-4

193.77.205.45:S3-12C1-4

scotty:S17

scotty:S1C2T2-12

IP Telephony Manager Console

To launch the IP Telephony Manager Console, use one of the following commands:

 # xtcmvfpd

or

 # xtcmvfpd *<target chassis IP address>*

The first command causes a list of the chassis components to display and then you can select the component that you want to start. The second command specifies the IP address of the component that you want started.

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Configuration

The configuration command line interface (CLI) uses the following syntax:

tcmget command:

tcmget [-h] [-l *logfile***] [-c readcomm] [-C writecomm] [-z] [-L] [-a] [-f** *file***] [-F] [-G** *group* **[***parameter***]...]...** *target*

tcmset command:

tcmset [-c readcomm] [-C writecomm] [-h] [-l logfile] [-z] [-L] [-f ***filename***] **-G group parameter value [parameter value]...target**

The options and parameters for the tcmget and tcmset commands are described below. Parameters are shown in parenthesis after the flag name as appropriate.

-c (readcomm)

SNMP read community string.

-C (writecomm)

SNMP write community string.

-h

Displays this help message.

-l (*logfile***)**

Log file for system diagnostic messages. GUI default: log to UNIX syslog; CLI default: stderr. Specify '-' (hyphen) to reverse these two behaviors.

-z

Disable set logging for this application.

-L

List all groups, or if -G is provided, list parameters for each group specified as part of a -G argument.

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-f (*filename*)

- tcmget: Place the result output of the get operation in a file given by <*filename*> (stdout can be designated using a filename of '-').
- tcmset: Read the output of the get operation from the file given by <*filename*> and use it to set the values. For example:

tcmset -f <*filename*> 192.77.203.74:s17

-a

This flag is available in the tcmget command only.

Store output in 'argument' format.

When used with -f, this allows the data in the output file to be supplied to a later tcmset operation, using commands like:

tcmset -f <*filename*> *target*

(This is most appropriate if there is only one current target being retrieved.)

-F

This flag is available in the tcmget command only.

List full name of each parameter in the result output. Otherwise, the abbreviated parameter names supplied in the -G argument will be used.

-G (group)

Selects a group, followed by a list of parameters within that group which are to be retrieved (for tcmget) or set (for tcmset). (For example, 'NMC Identification'.)

Group specifications must appear after all other command arguments, and before the target.

Group names are matched using substring comparison against the list of known group names for the target. Substrings that match at the beginning of a group name have precedence over substrings that match internally.

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(*parameter*)

Parameter whose value is to be printed (for tcmget) or set (for tcmset). (For example, 'Serial Number'.)

Each parameter should be separated by a space and requires proper shell quoting. At least one parameter should be supplied per group, unless -L (list parameters by group) is specified.

Parameter names are matched using substring comparison against the list of known parameter names within the currently selected group. Substring matching has the same 'initial match priority' and ambiguity rules as for group name matching.

(*value*)

This parameter is available in the tcmset command only.

Value of the parameter. Parameters can be one of the following value types:

- Integer—Decimal numeric value.
- Display String—Printable characters, suitably quoted.
- Octet String—Printable characters, or an ASCII hex string beginning with '0x' (any string starting with '0x' is assumed to be ASCII hex).
- IP Address—IP dot notation.
- Object Identifier—Must be a valid numeric object identifier (e.g. 1.3.6.1.4.1.429...)
- Enumeration—An enumeration, specified using substring match against the list of known for this variable (as seen in the Programmed Settings GUI). Rules for substring match similar to those for group and parameter names (see the "-G" option above).

Parameter types may be determined by using the -L option

(*target*)

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Specifies slots or channels to be issued commands. Target has the following format:

<*IP-host*>:S<*s-range*>[,C<*c-range*>][,S<*s-range*>[,C<*c-range*>]...]

where IP-host can be IP-dot notation, or a host name that is defined in the host database or /etc/hosts file.

- *:S<s-range>*—decimal number or a range s1-s2 (where s1 and s2 are decimal numbers and - is a literal hyphen) representing the location of card(s) within the chassis.
- *:C<c-range>*—decimal number or a range c1-c2 (where c1 and c2 are decimal numbers and - is a literal hyphen) representing the location of channel(s) on the specified card(s).

tcmget examples:

```
tcmget -G 'NMC Identification' 'Serial Number'
192.77.203.74:S17
```

(or using substring matching rules)

```
tcmget -G 'nmc id' 'serial number' 192.77.203.74:S17
```

To list parameters in NMC tests and system group:

```
tcmget -L -G 'nmc tests' -G 'system group'
192.77.203.74:S17
```

tcmset examples:

```
tcmset -G 'DTE Interface Settings' 'Default DTE Data
Rate' BPS19K\ mychas:s3c1
```

(or using substring matching rules)

```
tcmset -G 'dte int' 'dte data rate' bps19k mychas:s3c1
```

To list parameters in NMC Logging Group and Logging Traps Group:

```
tcmset -L -G 'logging gr' -G 'logging tr'
192.77.203.74:S17
```

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Actions/Commands

The command utility uses the following syntax:

tcmcmd [-q] -E *command* **-G** *group* **[-P** *parameter***][-F][-p** *seconds***]***target*

Query Current Command Status (-q)

Where:

[-q]

Displays the result of the last issued command the selected targets

Example:

tcmcmd [-q]*target*

-E *command*

command—a substring of valid commands

A substring match to the beginning of a command string has precedence over internal matches. For example, "res" executes the Restore from NVRAM command rather than the Software Reset command. Matching is case insensitive. Spaces in the command name must be quoted properly according to shell rules.

Command substrings can mean different commands depending on which group is selected and whether the command is being executed at the slot level or channel level. For example, for a modem, "reset" will perform a Hardware Reset at the slot level, but a Software Reset at the channel level. For a T1 card, "software" will initiate a Software Download if the Hardware group is selected, but a Software Reset if the Software group is selected.

-G *group*

The command type, hardware or software.

[-P *parameter***]**

The parameter to be supplied with command. Required for some devices, but can be omitted where not used.

[-F]

The component may be in a state where the selected command is normally rejected (for example, a modem in dial mode). Include this switch to force the command to execute, regardless of the safeguards. Not all commands use this feature.

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[-p seconds]

Sets amount of time, in seconds, between polls.

Target

Follows general syntax. Note that if you omit a channel range, the command is assumed to be targeted at the slot level. This applies as well to timeslot designations for commands sent to T1 cards-if the timeslot is omitted, the command will issued at the channel (span) level.

Set Trap Destination

The following commands are used to define where the traps are to send there output.

Except for the general syntax, the following trap destination-specific syntax must appear after the target designation in the command string.

To List Current Trap Destination Entries (-q)

Use the following command:

tcmtrap *target* **-q**

To Add a Trap Destination Entry (-a)

Use the following command, notice that the target must be supplied.

tcmtrap *target* **[-a** *ipaddr trapcomm comment***]**

Where:

ipaddr—IP address of destination device to be added.

trapcomm—Community string to supply with trap.

comment—Insert a descriptive comment—use shell quoting if necessary.

To Modify a Trap Destination Entry (-m)

Use the following command to change a current entry, where ipaddr is the IP address of the entry to change, and the other parameters are the information that will replace the old information.

tcmtrap *target* **[-m** *ipaddr trapcomm comment***]**

To Delete a Trap Destination Entry (-d)

To delete a trap destination entry, use the following command, where ipaddr is the IP address of the entry to be deleted:

tcmtrap *target* **[-d** *ipaddr***]**

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SNMP Commands

This describes how to set SNMP community strings and how to monitor the SNMP parameters.

For security reasons, you can not view the community strings through IP Telephony Manager.

Setting SNMP Community Strings

This section describes how to set the SNMP community strings.

[x]tcmcs [-h] [-c] readCommunity [-C] writeCommunity [-z] ***target***

Where:

-c readcomm

SNMP read community string.

-C writecomm

SNMP write community string.

-h

Displays this help message.

-l logfile

Log file for system diagnostic messages. GUI default: log to UNIX syslog; CLI default: stderr. Specify '-' (hyphen) to reverse these two behaviors.

-z

Disable set logging for this application.

target

IP-address or hostname (in hosts database e.g. /etc/hosts) of the chassis to be configured.

Monitoring SNMP Parameters

This section describes how to monitor any SNMP parameter and export the results in comma separated version (CSV) format.

tcmperf [-l *logfile***] [-h] [-c readcomm] [-C writecomm] [-z] [-L] [-f** *filename***] [-D** *delimiter***] [-p** *poll interval***] [-s** *# of samples***] [-G** *group* **[**parameter**]...]...** *target*

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Where:

-l (*logfile*)

Log file for system diagnostic messages. GUI default: log to UNIX syslog; CLI default: stderr. Specify '-' (hyphen) to reverse these two behaviors.

-h

Displays this help message.

-c (readcomm)

SNMP read community string.

-C (writecomm)

SNMP write community string.

-z

Disable set logging for this application.

-L

List all groups, or if -G is provided, list parameters for each group specified as part of a -G argument.

-f (*filename*)

Specifies the file to which to save the query result.

-D (*delimiter*)

Supplies field separators for a saved file.

If this is omitted, fields are padded with spaces to make columns line up.

-p

Specifies time between polls num in seconds. Default = 1.

-s

Specifies duration num in seconds. Default = 10.

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-G (BI)

Selects a group, followed by a list of parameters within that group which are to be retrieved. (For example, 'NMC Identification'.)

Group specifications must appear after all other command arguments, and before the target.

Group names are matched using substring comparison against the list of known group names for the target. Substrings that match at the beginning of a group name have precedence over substrings that match internally.

(*parameter***)**

Parameter whose value is to be printed. (For example, 'Serial Number'.)

Each parameter should be separated by a space and requires proper shell quoting. At least one parameter should be supplied per group, unless -L (list parameters by group) is specified.

Parameter names are matched using substring comparison against the list of known parameter names within the currently selected group. Substring matching has the same 'initial match priority' and ambiguity rules as for group name matching.

(target**)**

Specifies slots or channels to be issued commands. Target has the following format:

<*IP-host***>:S<***slot***>E<***entity***>**

where IP-host can be IP-dot notation, or a host name that is defined in the host database or /etc/hosts file

- *slot*—a decimal number or a range 1 or 2 (where 1 and 2 are decimal numbers) representing the location of the host/card within the chassis.
- *entity*—the system software (residing on the host) on which the results display.

Example:

```
tcmperf -c public -C private -f jwtest -D , -G 'System
Time' 'System Time' 149.112.207.30:S1E'Windows NT/OS'
```

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Tone Test

This section describes how to send and receive a tone test.

Send Tone Test (-S)

The following command causes the modem to send a tone of the specified frequency, duration, and amplitude.

tcmtone -S[-t][-s *num*]**[-p** *num*]
[freq[hz][*level***[db]]]***target*

Where:

-S

Initiates send tone test.

-t

Leave in test mode after exiting program.

-s

Specifies duration number in seconds. Default = 10.

-p

Specifies time between polls num in seconds. Default = 1.

Freq

Specifies frequency. Must be one of the following: 404, 1004, 2804. Default = 404. If specified, frequency must appear after all other flags and before level and target.

Hz

Optional (ignored). "hz" or "Hz" can be included for clarity.

Level

Specifies amplitude (integer) in dBm. Valid range = 0 to -43. Default = 0. If specified, frequency must immediately precede level.

Db

Optional (ignored). "db" or dBm" can be included for clarity.

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Receive Tone Test (-R) Use the following command to receive a tone test:

tcmtone -R [-t] [-s *num*] **[-p** *num*] *target*

Modem Tests

tcmtest -T *test* **[-s** *num*] *target*

Query Current Test Status To query a modem to determine whether a test is already in progress, send the following command:

tcmtest [-q] *target*

Test Type (-T)

-T *test*

Where:

test = modem test type substring. Select from the following list of tests:

- Local Analog Loop Back
- Local Digital Loop Back
- Remote Digital Loop Back
- V54 Local Analog Loop Back
- V54 Remote Digital Loop Back
- Self Tests
- Test RAM
- Test ROM
- Test NVRAM
- Idle Phone Line Test

A substring match to the beginning of a command string has precedence over internal matches. For example, "local analog" executes the Local Analog Loop Back test, not the V54 Local Analog Loop Back test. Matching is case insensitive. Spaces in the command name must be quoted properly according to shell rules.

Duration (-s)

[-s *num*]

num = number of seconds to remain in loop back mode. Default = 60

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Device Save and Restore

The following commands are used to save and restore the configuration on the specified device.

Save Configuration

tcmsave -f *filename target*

Where:

filename

The .whb output file to which the configuration is stored.

target

The IP address or hostname of the device.

For example:

tcmsave -f chassis1.whb 192.77.203.66

In this example, the utility saves the configuration data from the chassis with the IP address of 193.72.205.76 to a file called CHASSIS1.WHB.

Restore Configuration

To run tcmrestore, issue the following command:

tcmrestore -f *filename* **[-F] target**

Where:

filename

Filename of the .whb file with the configuration to be restored.

-F

Force restore. Restore configuration from .whb file regardless of component mismatch.

For example:

tcmrestore -f chassis1.whb 192.77.203.98

In this example, tcmrestore is using the file CHASSIS1.WHB to restore the configuration to the chassis with the IP address of 192.77.203.98.

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Software Download

To run tcmsdl, issue the following command:

tcmsdl [-s *sdlfile*] **[-n** *nacfile*] **[-F] [-v]** *target*

Where:

sdlfile

The SDL file name (if omitted, uses latest version available for card type).

nacfile

The NAC file name (if omitted, uses latest version available for card type).

-F

Force download to an NMC that is already in a download state.

Default directory for .nac and .sdl files is $TCMHOME/data/sdl.

For example:

```
tcmsdl -s qf020202.sdl -n qf030000.nac
192.77.203.127:S11-12
```

This example uses the Quad Modem SDL file qf020202.sdl and Quad Modem NAC file qf030000.nac to update the modem code in slots 11 and 12 of the chassis with IP address 192.77.203.127.

Upgrade File Identification

SDL and NAC filenames contain identifying information about card type, version level, and file type. The examples below show how to interpret this information from the filename:

Table 11 Sample Breakdown of SDL and NAC Filenames

Filename	Card-specific Prefix	Version #	File Type
nm040100.nac	nm	4.1.0	NAC
qf030005.nac	qf	3.0.5	NAC
li010101.sdl	li	1.1.1	SDL

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Filename Prefixes

Filename prefixes indicate which component type uses a given SDL or NAC file. In most cases, the NAC and SDL files for a given component have the same prefix. There are some exceptions, such as the Single T1 Card, as shown in the table below:

Table 12 Filename Prefixes

SDL Prefix	Card/Entity
hd	T1 HiPer DSP
he	E1 HiPer DSP
hr	E1/R2 HiPer DSP
hm	HiPer NMC
vs	3Com SNMP SubAgent (Gateway only)
vm	3Com SNMP Agent (VoIP Server only)
vg	Gateway
vk	Gatekeeper
vp	Provisioning Server
va	Accounting Server
vd	Directory Server
vh	Accounting Server
vt	Authentication Server
vn	SIP Proxy Server

Software Download Progress Messages

The Software Download utility displays the following messages or writes them to the log file:

Table 13 Software Download Progress Message Descriptions

Message	Description	Additional Information
BEGIN	Software Download utility invoked	Command is issued from the UNIX shell
BDISC	Begin chassis discovery	IP address
EDISC	End chassis discovery	IP address
BCONN	Begin connection to chassis	IP address
CONN	Chassis connection established	IP address
BSDL	Begin downloading SDL file	SDL file name, IP address, slot(s)
ESDL	End downloading SDL file	SDL file name, IP address, slot(s)
BERASE	Begin erasing target card's Flash ROM	IP address, slot(s)
ERASE	End erasing target card's Flash ROM	IP address, slot(s)
BNAC	Begin downloading NAC file to target card	NAC file name, IP address, slot(s)
ENAC	End downloading NAC file to target card	NAC file name, IP address, slot(s)
ERR	Error message	IP address, slots, description of error, and possible causes
SUM	Summary of Software Download process	IP address(es), slot(s) and status

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Table 13 Software Download Progress Message Descriptions (continued)

Message	Description	Additional Information
SIG	Software Download utility received a UNIX signal	Signal received. IP Telephony Manager/Solaris catches the following signals (to avoid termination): PIPE, TERM, USR1, and USR2.
END	Utility is terminated	

Feature Enable

The following command line launches the Feature Enable option:

tcminv [-l *logfile***] [-h] [-c readcomm] [-C writecomm] [***target***]**

Where:

-l *logfile*

The log file for system diagnostic messages.

The GUI log file default is the UNIX syslog file. The CLI default is stderr. You can reverse these defaults by specifying a "-" (hyphen).

-h

Displays the command line parameters and the descriptions of the parameters and their flags.

-c readcomm

The SNMP read community string.

-C writecomm

The SNMP write community string.

target

An optional parameter that specifies the chassis device to be feature enabled

If no target is specified, the GUI presents the file selection dialog and proceeds with file-based feature enable. If the target is specified, the GUI invokes manual feature enable.

The format for target is as follows:

<*IP-host***>[:S<***slot***>]**

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Where:

IP-host

Can be in IP-dot notation, or a host name that is defined in the host database or \etc\hosts file.

:S<*Slot*>

The decimal number representing the location of the card in the chassis.

Inventory

Use the following syntax to launch the Inventory utility:

tcminv [-l *logfile*] [-h] [-c readcomm] [-C writecomm]

[-d *delimiter*]

[-f *filename*] *target*

Where:

-l *logfile*

The log file for system diagnostic messages.

The GUI log file default is the UNIX **syslog** file. The CLI default is **stderr**. You can reverse these defaults by specifying a "-" (hyphen).

-h

Displays the command line parameters and the descriptions of the parameters and their flags.

-c readcomm

The SNMP read community string.

-C writecomm

The SNMP write community string.

-d *delimiter*

Supplies field separators for a saved file.

If this is omitted, fields are padded with spaces to make columns line up.

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-f *filename*

The file to save inventory to (for CLI only).

target

Specifies chassis host(s) to be displayed.

The format for target is as follows:

<*IP-host***>**

Can be in IP-dot notation, or a host name that is defined in the host database or /etc/hosts file.

Authorized Station Tool

The Authorized Station Tool can be accessed using the following syntax:

[x]tcmauth [-l *logfile***] [-h] [-c readcomm] [-C writecomm]** *target* **[-q] [-a** *ipaddr mask comment* **|** **-m** *ipaddr mask comment* **|** **-d** *ipaddr***]...**

Where:

-l *logfile*

The log file for system diagnostic messages

The GUI log file default is the UNIX syslog file. The CLI default is stderr. You can reverse these defaults by specifying a "-" (hyphen).

-h

Displays the command line parameters and the descriptions of the parameters and their flags.

-c readcomm

The SNMP read community string.

-C writecomm

The SNMP write community string.

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target

An optional parameter that specifies the IP address or hostname of the NMC in which stations are being configured

If no target is specified, the GUI behaves as if -h was the only parameter passed.

The format for target is as follows:

<*IP-host***>**

IP-host can be in IP-dot notation, or a host name that is defined in the host database or /etc/hosts file

CLI Parameters (-q, -a, -m, -d)

The CLI parameters must be supplied after the target at the end of the command line. Any, or all of them can be used in any order. They are executed in the order they appear in the command line.

These CLI parameters are described in the following table:

Table 14 CLI Parameter Descriptions

Parameter	Description
-q	Lists all Authorized Station currently configured in the target NMC and then exits. This overrides the specification of -a, -m, or -d.
-a	Adds an Authorized Station to the Authorized Station Table.
Ipaddr	IP address of the new station.
Mask	New network mask.
Comment	New descriptive comment; use shell quoting as necessary.
-m	Changes the network mask/comment of an Authorized Station.
Ipaddr	IP address of entry to be modified.
Mask	New network mask.
Comment	New descriptive comment; use shell quoting as necessary.
-d	Deletes an Authorized Station from the Authorized Station Table.
Ipaddr	IP address of the entry to be deleted.

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AutoResponse

The AutoResponse can be invoked by the following syntax:

tcmarsp [-E *event*] **[-h] [***target***]**

Where:

-E *event*

Specifies which event to use as the default.

The specified parameter must be a substring of one of the event descriptive strings described below. Substrings that match at the beginning of the descriptive string have precedence over those that match in the middle. When there are embedded spaces in the substring, the event should be properly quoted according to shell rules. The match is case insensitive.

If no event is specified, the GUI defaults to the entire list of AutoResponse events.

Chassis Level Events and Responses

The following are the events and the responses to the events from the AutoResponse command

Events

- PSU Voltage Out of Range
- PSU Failed
- Fan Failed
- HUB Temperature Out of Range
- Global Timer 1 Expired
- Global Timer 2 Expired
- Global Timer 3 Expired
- Global Timer 4 Expired

Responses (the "(N)" notation indicates that the response requires a parameter):

- Generate AutoResponse SNMP Trap ID (N)
- Delay Script Execution (N) Seconds
- Terminate Script Execution
- Continue If Test Passes
- Configure Module From NMC NVRAM
- Configure Module From NMC Factory Defaults
- Test module
- Reset module

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Slot Level Events and Responses

The following are the events and the responses to the events from the AutoResponse command

Events:

- Module Inserted
- Module Re-initialized
- Module Removed
- Module Non-operational
- Module Watchdog Time-out

Responses (the "(N)" notation indicates that the response requires a parameter):

- Generate AutoResponse SNMP TRAP ID (N)
- Delay Script Execution (N) Seconds
- Terminate Script Execution
- Continue if Test Passes
- Configure Module from NMC NVRAM
- Configure Module from NMC Factory Defaults
- Remove Module from Service
- Restore Module to Service
- Test Module
- Reset Module
- Busy-Out Module's Analog Phone Lines
- Restore Module's Analog Phone Lines

The last two responses pertaining to analog phone lines are not available on slots that contain an unknown card type.

Modem Channel Level Events and Responses

The following are the events and the responses to the events from the AutoResponse command.

Events:

- Incoming Connection Established
- Outgoing Connection Established
- Incoming Connection Terminated
- Outgoing Connection Terminated
- Connection Attempt Failed
- Connection Time Limit Expired

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- Reset By DTE
- DTE Transmit Idle
- Block Error Count at Threshold
- Fallback Count at Threshold
- Dial Out Login Failure
- Dial Out Restricted Number
- Dial In Login Failure
- Dial Back Restricted Number
- Dial Back Using Restricted Modem
- Login Attempt Limit Exceeded
- User Blacklisted
- Attempted Login by Blacklisted User
- Response Attempt Limit Exceeded
- Modem Watchdog Reset
- Management Bus Failure
- DTR True
- DTR False
- Modem Ring No Answer
- DTE Ring No Answer
- No Dial Tone
- No Loop Current Detected
- Global Timer 1 Expired
- Global Timer 2 Expired
- Global Timer 3 Expired
- Global Timer 4 Expired
- Packet Bus Active
- Packet Bus Lost

Responses, (the "(N)" notation indicates that the response requires a parameter):

- Generate AutoResponse SNMP TRAP ID (N)
- Delay Script Execution (N) Seconds
- Terminate Script Execution
- Continue if Test Passes
- Reconfigure from NVRAM
- Reconfigure from Modem Factory Defaults

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- Test Modem
- Test Analog NIC
- Test Analog Phone Line
- Restore Analog Phone Line
- Busy out DS0 - T1 Slot (N) Span (N) Channel (N)
- Restore DS0 - T1 Slot (N) Span (N) Channel (N)
- Modem Software Reset
- Terminate Connection
- Busy Out Analog Phone Line

-h

Displays the command line parameters and the descriptions of the parameters and their flags.

-c readcomm

The SNMP read community string.

-C writecomm

The SNMP write community string.

target

An optional parameter that specifies the IP address or hostname of the NMC in which stations are being configured

If no target is specified, the GUI behaves as if -h was the only parameter passed.

The format for target is as follows:

<*IP-host***>:S<***s-range***>[C<***c-range***>][,S<***s-range***>[C<**c-range**>]...]**

Where:

IP-host

Can be in IP-dot notation, or a host name that is defined in the host database or \etc\hosts file.

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:S<*s-range***>**

A decimal number of a range s1-s2 (where s1 and s2 are decimal numbers separated by a literal hyphen) representing the location of the card(s) in the chassis.

:C<c-range**>**

A decimal number or a range c1-c2 (where c1 and c2 are decimal numbers separated by a literal hyphen) representing the channel number(s) on the specified cards.

Only the IP address of the of the chassis needs to be specified. If this is the case, a graphical window will open showing the VFPD allowing the user to graphically select the desired targets.

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GLOSSARY

This appendix lists acronyms and terminology used in the CommWorks VoIP application.

A-Link Access link. SS7 Signaling link used to connect the Signaling Transfer Point (STP) and Signaling Switch Point (SSP).

ACF Admission Confirm—This is a call flow message.

AMI Alternate Mark Inversion—A line encoding scheme for transmitting data bits over T1 and E1transmission systems.

ANI Automatic Number Identification—The billing number of the person making the phone call. ANI allows the calling party to be billed without having to enter a PIN.

ARJ Admission Reject—This is a call flow message.

ARQ Admission Request—This is a call flow message.

AIS Alarm Indication Signal—Formerly referred to as a 'blue alarm' or 'blue signal'. This is a signal that is created when a maintenance alarm indication has been activated. This signal is transmitted downstream informing that an upstream failure has been detected.

AS Autonomous System—An independent system.

AUX Auxiliary—Backup or acting as a redundancy on the system.

B8ZS Binary Eight Zero Code Suppression—Line-code type, used on T1 and E1 circuits. A special code replaces any eight consecutive zeros that are sent over the link. This code is then interpreted at the remote end of the connection. This technique guarantees ones density independent of the data stream. Sometimes this is referred to as bipolar 8-zero substitution.

BHCA Busy Hour Call Attempts—The number of calls attempted within 60 minutes during the busiest times during the day.

CC Country Code—When calling outside of the country, the called number consists of the country code, identifying the country where the person to be called resides and a NSN (National Significant Number). The code of the country is the first three digits dialed.

CCS Common Channel Signal—This is a Bellcore definition: A network architecture which uses Signalling System 7 (SS7) protocol for the exchange of information between telecommunications nodes and networks on an out-of-band basis.

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CD Collision Detection—A process where a simultaneous transmission has taken place. Workstations can determine if this has happened if they do not receive an acknowledgement from the receiving station within a certain amount of time. When this occurs, the workstation will try again.

CDR Call Detail Record—Information gather during the call used later for billing purposes.

CE Connection Endpoint—A terminator at one end of a layer connection within SAP.

CEPT Conférence des administrations Européenes des Postes et Télécommunications (European Conference of Postal and Telecommunications Administrations)—A standards committee in Europe for the telecommunications industry.

CHS Cylinder-head Sector—The method of identifying a given location on a hard drive.

CISPR International Special Committee on Radio Interference

CLI Command Line Interface—A software interface allowing the user to interact with the operating system by entering commands and optional arguments. The UNIX operating system runs at the command line from a shell prompt or a shell script.

CMOS Complementary Metal Oxide Semiconductor

CNG Comfort Noise Generation—The process of adding white noise to the voice channel so the people know the connection is still good when neither party is talking.

CO Central Office—The telephone company facility where the request for service comes through the switching equipment and the requests for service gets routed.

CommWorks IP Telephony System A total system of hardware and software components that route telephone calls and data over an IP based network (VoIP).

CPE Customer Presence Equipment—A piece of equipment that is attached to a telephone network. This equipment would be the terminal equipment, telephones, key systems, modems, video conferencing devices and so on.

CPU Central Processing Unit—The part of the computer that executes the commands and performs the logic.

CRC Cyclic Redundancy Check—The process to determine if the data was received properly.

CSA 1. Call Path Services Architecture—An architecture developed by IBM which defines the protocols that allow communications between the telephones switches and computers. 2. Carrier Serving Area—A method used to categorize the local loops by length, gauge, and subscriber distribution for maximum service and cost efficiency.

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CSMA Carrier Sense Multiple Access—Media-access mechanism wherein devices ready to transmit data first check the channel for a carrier. If no carrier is sensed for a specific period of time, a device can transmit. If two devices transmit at once, a collision occurs and is detected by all colliding devices. This collision subsequently delays retransmissions from those devices for some random length of time.

CTS Clear to Send—Hardware signal defined by the RS-232 specification that indicates that a transmission can proceed.

CLASS Custom Local Area Signaling Services—CLASS is a service mark of Bellcore. It is the signaling service available such as caller-id, call waiting, and auto-redial.

DCD Data Carrier Detected—Hardware signal defined by the RS-232-C specification that indicates that a device such as a modem is online and ready for transmission.

DCE Data Communication Equipment—A communications device that can establish, maintain, and terminate a connection (for example, a modem). A DCE may also provide signal conversion between the data terminal equipment (DTE) and the common carrier's channel.

DCF Disengage Confirm—This is a call flow message.

DHCP Dynamic Host Configuration Protocol—A protocol that allows network administrators to centrally manage and automate the assignment of Internet Protocol (IP) addresses in their organization's network.

DHTML Dynamic Hypertext Markup Languages—A name for a set of programs that developers can use to create Web pages that update themselves on the fly. Dynamic HTML makes your Web documents more interactive than HTML.

DIMM Dual Inline Memory Module—Has a 10% higher capacity bandwidth than Single In-line memory module (SIMM). The DIMM's data path is 128 bits wide.

DIN Deutsche Institute fur Normung (German Institute for Standardization)—DIN specifications are issued under the control of the German government. The most common specification is the dimensions of cable connectors referred to as DIN connectors.

DINS Dialed Number Identification Service

DIP Dual Inline Package—These are small on and off switches on the circuit board used to configure the board in a semipermanent way. The DIP switches are the first thing to look at when a configuration isn't what you intended after an installation.

DMS Digital Multiplex System—A digital switch that is used in a central office. It contains multiple devices to handle the many needs of the system. Such as, local/toll exchange, long distance switch, international gateway, local and long distance switch, wireless, and advanced signaling solutions.

DNS Domain Name Server—System used in the internet for translating names of network nodes into addresses.

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DRAM Dynamic Random Access Memory—The readable/writable memory used to store data in PCs. DRAM stores each bit of information in a "cell" composed of a capacitor and a transistor.

DRJ Disengage Reject—This is a call flow message.

DRQ Disengage Request—This is a call flow message.

DS Digital Signal—Standard specifying the electrical characteristics for data transmission over four-wire telco circuits. DS1 is 1.544 Mbps, and DS3 is 44.736 Mbps. Also referred to as T1 and T3.

DS0 1. Digital Signal level zero—It is equivalent to one voice conversation digitized under PCM. It transmits digital signals over a single channel at 64-kbps on a T1 facility 2. Data Slot 0

DSP Digital Signaling Processors—A special computer chip designed to process digital signals that were originally analog signals.

DSR Data Set Ready—This is a call flow message.

DTE Data Terminal Equipment—End-user equipment, typically a terminal or computer, that can function as the source or destination point of communication on the network.

DTMF Dual Tone Multi-frequency—The sounds a touch-tone telephone makes when its keys are pressed.

DTR Data Terminal Ready—A control signal that is activated to let the DCE know when the DTE is ready to send and receive data.

DTS Data Transformation Service—Technology designed for bypassing functions for short-hop, line-of-sight applications. It never converts to analog. Its main use is in high volume, data only applications in urban areas where line costs are higher.

ECC Error Correcting Code—Code that determines whether line noise has caused data to be garbled or dropped in transit, and then works to correct the problem. The two most common error-correction protocols and standards used by analog modems are MNP and V.42.

EdgeServer Pro Card This card on the Total Control Chassis runs Windows NT 4.0 Server, provides two 10/100-Mbps ethernet interfaces, and routes call over IP networks.

Edge server card This card on the Total Control Chassis runs Windows 2000 Server, provides two 10/100-Mbps ethernet interfaces, and routes call over IP networks.

EDO RAM Extended Data Out Random Access Memory—A more efficient method to access memory. It reduces access memory time by 10% over the standard DRAM chips.

EIA Electronic Industries Alliance—A trade organization who sets standards for electronics.

EMC Electromagnetic Compatibility—The ability of a device or system to function without error in its intended electromagnetic environment.

EMI Electromagnetic Interference—The leakage of radiation from equipment.

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ESD Electrostatic Discharge—Discharge of stored static electricity that can damage electronic equipment and impair electrical circuitry, resulting in complete or intermittent failures.

ESF Extended Super Frame—Framing type used on T1 circuits that consists of 24 frames of 192 bits each, with the 193rd bit providing timing and other functions. ESF is an enhanced version of super frame (SF).

ESIG Extended Signaling—A system internal to Total Control which ingresses and distributes SS7 signaling throughout the Chassis via the packet bus.

ETSI European Telecommunications Standards Institute—Similar to the ANSI in the United States. It's purpose is to provide standards for the telecommunications industry.

FCC Federal Communications Commission—A United States federal regulatory agency which oversees all aspects of the communications industry, TV, radio, telephone etc. in the United States.

FTP File Transfer Protocol—Application protocol, part of the TCP/IP protocol stack, for transferring files between network nodes. FTP is defined in RFC 959.

GCF Gatekeeper Confirm—This is a call flow message.

GK Gatekeeper—A device that manages an IP network, supporting all gateways, user profiles, and authentication. A gatekeeper is defined by the H.323 standard.

GRJ Gatekeeper Reject—This is a call flow message.

GRQ Gatekeeper Request—This is a call flow message.

GSM Global System for Mobile Communications—The European standard for digital cellular service using slow frequency-hopping and TDMA.

GW VoIP Media Gateway—A CommWorks VoIP device that can interconnect networks with different, incompatible communications protocols. The gateway performs a layer-7 protocol-conversion to translate one set of protocols to another (for example, from TCP/IP to SNA or from TCP/IP to X.25). A gateway operates at OSI layers up through the Session Layer.

GUI Graphical User Interface—A software interface based on pictorial representations and menus of operations, commands, and files. Opposite of the operating system command line interface.

HDB3 High Density Bipolar Three Zeros—A bipolar coding method that does not allow more than three consecutive zeros in the line signaling.

HDM High Density Modem—The HiPer DSP card in the VoIP system. It implements the PSTN interface and CODEC functions of the VoIP system. It contains 24 channels per card (T1-PRI) or 31 (E1-PRI) channels per card.

IC Industry Canada—A department of the Canadian government. It serves to promote all aspects of Canada's economy. It's charter is to improve conditions for investment, improve innovation performance, increase Canada's share of global trade and build a fair, efficient and competitive marketplace.

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IDE Integrated Drive Electronics—Standard interface to the hard disk drive on the PC.

IEC International Electrotechnical Commission—The international standards body for electrotechnology.

IIS Internet Information Server—Microsoft Windows NT web based server. It allows you to create control and manage a web site remotely.

IMT Inter-Machine Trunks—In the SS7 network, the IMT is the channel that carries the data to the SSP.

ISUP Intergrated Services Digital Network User Part —This is the control function of the SS7 protocol. It determines the call setup, administration, and call take down on the SS7 network. In the SS7 system with VoIP enabled, the ISUP commands are converted to SLAP commands.

I/O Input/Output

IP Internet Protocol—A set of instructions that controls the node addresses, routes the messages, and so on of the internet.

IP Telephony Manager IP Telephony Manager is a software application developed by CommWorks, a division of 3Com, that runs on a UNIX management station. This application remotely manages 3Com Network Application Cards (NACs) and Network Interface Cards (NICs) through a Network Management Card (NMC) installed on the CommWorks 5210 IP Telephony Platform.

ISA Industry Standard Architecture—The most common bus architecture on the motherboard of a MS-DOS based computer.

ISDN Integrated Service Digital Network—A system that provides simultaneous voice and high-speed data transmission through a single channel to the user. ISDN is an international standard for end-to-end digital transmission of voice, data, and signaling.

ITG Internet Telephony Gateway— A bridge between traditional circuit-switched telephony and the internet that extends the advantages of IP telephony to the standard telephone by digitizing the standard telephone signal (if it isn't already digital), significantly compressing it, packetizing it for the internet using Internet Protocol (IP,) and routing it to a destination over the internet.

ITU International Telecommunications Union—An organization established by the United Nations, of which almost every nation is a member. Its charter is to define standards for telegraphic and telephone equipment.

LAN Local Area Network—A short distance data communications network. Usually found within a building or a campus environment.

LCF Location Confirm—This is a call flow message.

LEC 1. Local Exchange Carrier—The telephone company servicing the local area. 2. Line Echo Canceler—A module placed on the line to keep the noise and vibration on the line to a minimum.

LED Light Emitting Diode—Semiconductor device that emits light. Status lights on hardware devices are typically LEDs.

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LRJ Location Reject—This is a call flow message.

LRQ Location Request—This is a call flow message.

MBP Management Bus Protocol—This protocol was developed by 3Com and is used in the NMC to communicate to the other cards in the Total Control chassis.

MFC Multifrequency Compelled—An E1 call setup protocol that requires the signals to be acknowledged.

MIB Management Information Base—A key element of SNMP management systems. A collection of objects that can be accessed via a network management protocol; holds information about all resources managed by a network management system.

NAC Network Access Card—the card in front of the Total Control chassis. It connects to the NIC in back. It allows the Total Control chassis to receive information from the NMC, then processes it and sends it out the NIC.

NANP North American Numbering Plan—The scheme used to identify the telephone trunks. It is composed of a three digit prefix and the four-digit suffix.

NDC National Destination Code—Used to identify a Public Land Mobile Network (PLMN) within a country.

NAC Network Application Card—In the Total Control chassis, this card is located in the front of the chassis. It allows communication to the VoIP application.

NIC Network Interface Cards—In the Total Control chassis, this card is located in the back of the chassis. It allows access to the network.

NMC Network Management Card—The NMC provides the management of all the cards in the Total Control chassis.

NLP Non-Linear Processing—Processing of a request for service that does not take the normal route as defined by the PSTN.

NMC Network Management Card—Manages all of the devices in the Total Control chassis under the direction of a PC running IP Telephony Manager software.

NSM Non-Standard Message—A type of non-standard message that is allowed by ITU T.30.

NTFS NT File System—The file system on Windows NT servers.

NTP Network Time Protocol—Protocol built on top of TCP that assures accurate local time-keeping with reference to radio and atomic clocks located on the internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods.

NVRAM Non-volatile Random Access Memory—Ram that retains its contents when a unit is turned off.

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OOBMAN Out-of-band Manager—OOBMan is an application that runs on 3Com Windows NT components of the CommWorks IP Telephony platform.

It is designed to allow a user to dial into an NT device, using a terminal emulation program such as Hyperterminal, and view or modify various configuration information on that machine.

OS Operating System—A software program that controls and manages the operations of a computer system.

OOF Out-of-frame—OOF conditions occurs in a T1 transmission when two or more out of four consecutive framing bits are in error.

OOS Out-of-service—The term used when a module or card is not functioning. It could be because VoIP has taken it OOS due to errors, or because the card or module has been removed from the chassis.

PCI Peripheral Component Interconnect—Designed by Intel. It is a 32-bit local bus on a PC to transfer data between the CPU and the peripherals.

PCM Pulse Code Modulation—Technique for converting an analog signal to a digital signal.

POTS Plain Old Telephone System—Standard telephone service used by most residential locations. See PSTN.

PRI Primary Rate Interface—ISDN interface to primary rate access. In the U.S., the Primary Rate Interface is split into 23 B channels and one 64 Kbps D channel. PRI is delivered over the same physical link as a T1, or 1.55 Mbps link. In Europe, PRI is split into 30 B channels and one 64 k bit/second D channel and is delivered over the same physical link as an E1.

PSI Power Supply Interface—The card on the chassis that controls the power for the chassis.

PSTN Public Switched Telephone Network—The analog dial-tone-type telephone networks and services in place worldwide, with transmission rates up to 52Kbps. In contrast, telephone services based on digital communications lines, such as ISDN, have higher speeds and bandwidths. The POTS networks also called the public switched telephone network (PSTN).

PSU Power Supply Unit—This unit is part of the Total Control chassis. It controls the power to the chassis. The PSU can be either AC or DC power with 35A, 45A, 70A, or 130A ratings.

QOS Quality of Service—An indicator of the performance of a transmission system on the Internet and other networks. QoS is measured in transmission rate, error rates, latency, and other characteristics, and can to some extent be guaranteed to a customer in advance.

RAS Remote Access Service—Remote access is sending and receiving data to and from a computer or controlling computer with terminals or PCs connected through phone/communications links. A remoter access service provides this function.

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RCF Registration Confirm—This is a call flow message.

RISC Reduced Instruction Set Computer— Central processing unit architecture that greatly reduces processing time by having fewer, simpler instructions programmed into ROM, but allowing for complex processing by combining these simple instructions; primarily used in workstations.

RFI Radio Frequency Interface—An interface of a programmable switch matrix between the RF test instruments of a CASS RF or CNI configuration to a series of front panel bulkhead connectors.

RRAS Routing and Remote Access Service—Microsoft Windows NT's (RRAS) Routing and Remote Access Service is used for terminating RAS/PPP calls on a Microsoft Windows NT system.

RRJ Registration Reject—A registration request from an H.323 Gateway to an H.323 Gatekeeper was rejected.

RRQ Registration Request—An H.323 Gateway has requested to register with a remote H.323 Gatekeeper endpoint.

RTP Real Time Protocol—The format of the audio/voice data as it travels through VoIP.

RTS Request to Send—An RS-232 signal provided by a DTE device to a DCE device saying "I am ready when you are". The RTS/CTS RS-232 signals are often used for flow control between a modem and serial port.

SCSI Small Computer System Interface—The way the peripherals communicate with the computer's main processor.

SDL Signaling Data Link or Software Download

SF Super Frame—Common framing type used on T1 circuits. SF consists of 12 frames of 192 bits each, with the 193rd bit providing error checking and other functions. SF is superseded by ESF, but is still widely used. Also called D4 framing.

SCP Service Control Points—The SCP stores customer specific information for example, toll free numbers, and converts the information received from the incoming call and directs the call to its destination.

SIP Session Initiation Protocol—Provides advanced telephony services across an IP network.

SGP Signaling Gateway Platform—This is the SS7 Signaling Gateway platform. 3Com's SS7 signaling Gateway is an intelligent service exchange node that integrates services between the circuit and packet networks to deliver significant cost savings with IMTs for voice trunk access instead of ISDN PRIs.

SLAP Signaling LAN Application Protocol—SLAP is the interface between the Total Control Chassis and the external SS7 Gateway system. It replaces the D-channel signaling that normally exists in an ISDN PRI interface. SLAP is 3Com's proprietary software.

SSP Signaling Switch Point—Simply put, this is the telephone switch.

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SS7 Signaling System 7—A global standard for telecommunications as defined by the International Telecommunication Union (ITU). The SS7 standard defines the procedure protocol by which network elements in the PSTN exchange information over a digital signaling network.

SMS System Management Services—Allows provisioning and updating of information on subscribers and services in near-real time for billing and administrative purposes.

SNMP Simple Network Management Protocol—Standardized method of managing and monitoring network devices on TCP/IP-based internets. A standard way for computers to share networking information. In SNMP, two types of communicating devices exist: agents and managers. An agent provides networking information to a manager application running on another computer. The agents and managers share a database of information, called the Management Information Base (MIB). An agent can use a message called a traps-PDU to send unsolicited information to the manager.

SQL Structured Query Language—A standard interactive and programming language for requesting information from and updating databases.

SRAM Static Random Access Memory—Type of RAM that retains its contents for as long as power is supplied. SRAM does not require constant refreshing, like DRAM.

SS Silence Suppression—A way to save on bandwidth by not transmitting the silences or gaps in conversation. A voice compression process where the time when there is no voice being transmitted over the line during a conversation, that space is filled with data, and video transmission on the line.

SST Silence Suppression Threshold—The limit of silence allowed on the voice transmission before data, and video packets are sent on the line. This can be defined by the user.

STP Signal Transfer Point—SS7 Signal Routing Node. It is a very reliable packet switch used to forward signaling messages in an SS7 network. The network switches and the SCPs connect directly to the STPs for message routing.

SVGA Super Video Graphics Array—An enhancement of the VGA display standard. SVGA can display at least 800 pixels horizontally and about 600 lines vertically.

TCM Total Control Manager—See IP Telephony Manager.

TCP Transmission Control Protocol—Connection-oriented protocol that provides a reliable byte stream over IP. A reliable connection means that each end of the session is guaranteed to receive all of the data transmitted by the other end of the connection, in the same order that it was originally transmitted without receiving duplicates.

TDM Time Division Multiplexing—A technique in which information from multiple channels can be allocated bandwidth on a single wire based on preassigned time slots. Bandwidth is allocated to each channel regardless of whether the station has data to transmit.

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TDMA Time Division Multiplexing Adapter—A device that allows analog voice and data devices to work through an ISDN connection. The terminal adapter is a protocol converter that adapts equipment not designed for ISDN, such as phones, faxes, and modems.

TFTP Trivial File Transfer Protocol—simplified version of the File Transfer Protocol (FTP) that transfers files but does not provide password protection or user directory capability.

Total Control Manager TCM—See IP Telephony Manager.

UCF Unregistration Confirm

UDP User Datagram Protocol—Connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagrams without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols. UDP is defined in RFC 768.

UI User Interface—In telephony terms, this is the reference point for the BRI connection between a telephone company local loop and the customer equipment.

UL Underwriters Laboratory—A non-profit laboratory that examines and tests items submitted by their manufactures for safety.

UNC Names Universal Naming Convention Names—Naming conventions for file names or other resources beginning with '\\', indicating that they exist on a remote computer.

URJ Unregistration Reject—This is a call flow message.

URQ Unregistration Request—This is a call flow message.

UTP Unshielded Twisted Pair— Four-pair wire medium used in a variety of networks. It consists of copper conductors that are electrically balanced.

VDE Verbund Deutscher Electronicker—Federation of German Electrical Engineers, similar to the IEEE in the United States.

VFPD Virtual Front Panel Display—Refers to the GUI display of the Total Control 1000 chassis.

VoIP Voice Over Internet Protocol—A set of protocols for managing the delivery of voice and data information using the Internet Protocol (IP). Voice and data information is sent in digital form in discrete packets over the Internet instead of in analog form over the public switched telephone network (PSTN). A major advantage of VoIP is that it avoids the tolls charged by ordinary telephone service.

VRAM VIrtual Random Access Memory

WAN Wide Area Network—Public or private computer network serving a wide geographic area.

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ZCS Zero Code Suppression—Used primarily with T1. The insertion of a one bit to prevent the transmission of eight consecutive zeros on an active line. When eight or more consecutive zeros are detected on the line, the system considers the line inactive, and releases the line.

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